HP LP 1000r Netserver Service Manual

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Hewlett-Packard Company
Network Server Division
Technical Communications/MS 45SLE
10955 Tantau Avenue
Cupertino, CA 95014 USA

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Audience Assumptions

This guide is for the person who services LAN servers. Hewlett-Packard Company assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

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1 General Information

Notice to Service Technicians

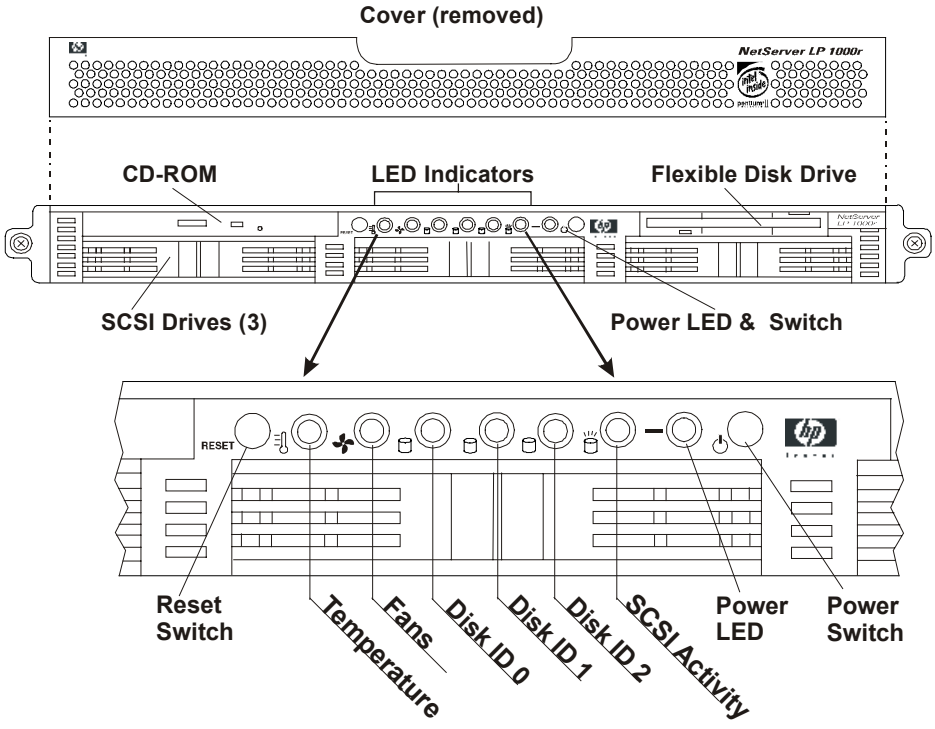
This is the service document for the HP Netserver LP 1000r. You may also need to access the HP Netserver LP 1000r User Guide that is available on the Network Server Division WEB site:

http://www.hp.com/netserver/

The HP Netserver LP 1000r User Guide contains additional information on the installation process, which the end users follow. Both documents are needed for complete servicing information.

Front Panel

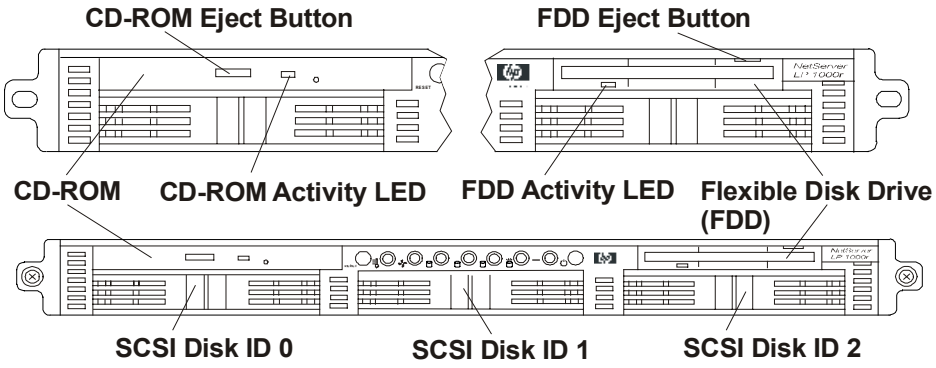
The front panel of the HP Netserver provides the controls and indicators commonly used when operating the Netserver.



Front Panel

Tables 1-1 and 1-2 describe the front panel controls and indicators in the center of the front panel. Refer to the next figure for the mass storage controls and indicators.

The input and storage devices provide additional front panel controls and indicators, which give control and operational status of the respective device.



Input and Storage Device Controls

Table 1-1. Power Switch and

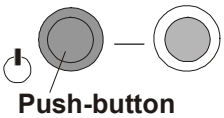
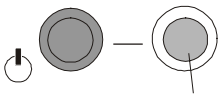
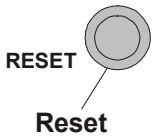
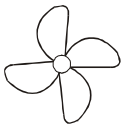
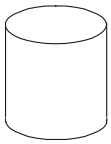
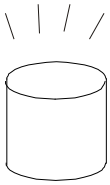
Control/Indicator	Description
Power On/Off/Sleep Switch  **Push-button Switch**	This push-button turns the HP Netserver power On or Off, and if available, also transitions the Netserver between Power On and sleep states. If sleep states are not available, then this button only turns power On or Off. The sleep states are NOS dependent and not available if your NOS does not support power management based on the ACPI (Advanced Configuration and Power Management Interface) standard. Refer to "Applying Power to the HP Netserver" and "Sleep States (ACPI)" later in this chapter.
On/Off/Sleep LED  **LED**	This green LED indicator provides the power state of the Netserver: • **Steady Green** when the Netserver is operating normally • **Blinking Green** at 1-Hz rate indicates the Netserver is in a sleep state and under ACPI control. • **Off** (unlit)when the Netserver is powered off or in standby
Reset Switch  **Reset Switch**	This push-button momentary switch creates a hard system reset, when pressed. This is equivalent to a power-on reset.

Table 1-2. Component Indicators

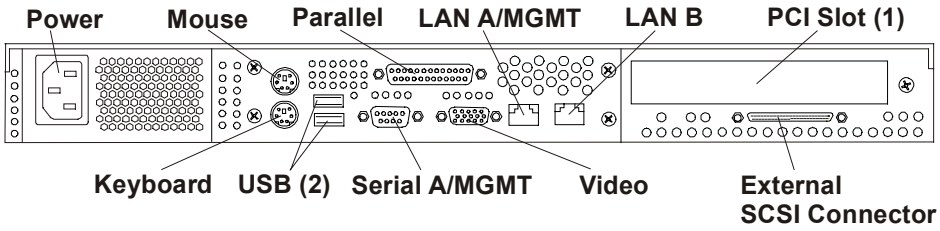
LED ICON	Description
Temperature LED 	This Temperature LED has two distinctive colors: • **Steady Green** for normal operation • **Steady Red** indicating the temperature has exceeded the critical threshold
Fan LED	This Fan LED and its sensor monitors the fan speed of all fans in the HP Netserver and has two distinctive colors: • **Steady Green** for normal fan speed operation

LED ICON	Description
	• **Steady Red** indicating the fan speed has slowed down or crossed the critical threshold.
Disk ID 0, 1, and 2 LED 	These Disk LEDs have five distinctive states for the respective SCSI disk drive: • **Off** for SCSI drive not present • **Steady Green** for SCSI drive present • **Steady Red** for a SCSI drive failure. • **Alternating Green/Red** at 1 Hz blink rate for a SCSI drive rebuild. • **Alternating Green/Red** at 3 Hz blink rate for a SCSI drive identify
SCSI Activity 	This LED is the SCSI Hard Disk Drive Activity indicator. • **Flickering Green** when there is SCSI activity • **Off** when there is no power or SCSI activity

Rear View

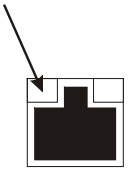
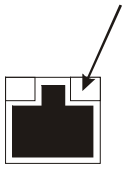
The ports and connectors at the rear are listed below.

- The power connector accepts a standard power cable to connect the HP Netserver LP 1000r with a UPS or the site power source.
- The mouse port accepts a standard mouse with a PS/2 connector.
- The keyboard port accepts a standard keyboard with a PS/2 connector.
- The USB (2) ports are provided for printers, scanners, and external modems.
- The Parallel Port is a standard parallel port, which supports Extended Capabilities Port (ECP)/Enhanced Parallel Port (EPP).
- The Serial A/MGMT Port is a standard serial port, which can be used for serial devices, or for management functions.
- The Video Port interface specifications are listed in Chapter 2.
- The two LAN ports (LAN A/MGMT and LAN B) are for embedded controllers based on Intel's 82559 10/100 BaseT Fast Ethernet controller. Only LAN A/MGMT is used with Alert-on-LAN 2 (AOL2) and Wake-on-LAN remote management functions. Each one has a RJ-45 LAN connector and two LEDs to indicate LAN speed and valid connection. Refer to Table 1-3 for the LAN LED indicators.
- The external SCSI port provides access to external SCSI devices, typically an external SCSI tape back-up device.



Rear Panel and Ports

Table 1-3. LAN Port (RJ45) LED Indicators

Indicator	Definition
Link LED 	This green LED is the activity/link indicator. **A steady on** LED indicates a valid LAN link. **A flashing** LED indicates there is LAN activity.
LAN Speed Indicator 	This yellow LED is the LAN speed indicator. **A steady off** LED indicates the LAN is operating at 10 Mbps LAN speed. **A steady on** LED indicates the LAN is operating at 100 Mbps LAN speed.

Applying Power to the HP Netserver

Powering-Up the Netserver

NOTE Turn on power to the monitor connected to the HP Netserver before you power-on the Netserver. This allows proper auto-configuration of video output of the Netserver as it boots up.

1. Ensure the HP Netserver's power cord is connected to the power source.
2. Press the Power push-button on the front control panel.

When you press the power button on the control panel, the Netserver powers up and loads the operating system. The system runs a set of power on self tests (POST) during this process.

NOTE The HP Netserver supports a headless boot, that is, the keyboard and mouse to not need to be connected to the Netserver to complete the boot process.

Powering-Down the Netserver

1. Log off all users and if necessary, backup files.

   ◊ Schedule the power down for a time when the Netserver being down will affect the fewest users.

- ◊ If you will be doing any kind of hardware or software upgrade, ensure the Netserver's data has been backed up.
- ◊ Follow instructions in your network operating system (NOS) documentation to shut down all networking software and applications.

WARNING	The power supply will continue to provide standby current to the Netserver until the power cable is disconnected from the rear panel.

2. Press the power switch on the HP Netserver's control panel when prompted by the operating system.

Normally this completes the power-down procedure.

Connecting AC Power to Multiple-Server Configurations

The HP Netserver temporarily draws a large "inrush current," when first connected to an AC power source. This also occurs when the Netserver is in a standby mode (power is turned off, but the power cord is plugged into AC power). The inrush current is much greater than the Netserver's normal operating current and generally, the AC power source can handle the normal inrush current.

However, if you install several HP Netservers on one circuit, precautions are necessary. If there is a power failure and power is then restored, all the servers immediately begin to draw inrush current at the same time. If the circuit breakers on the incoming power line have insufficient capability, the breaker may trip and thus prevent the servers from powering up.

When preparing your site for installation, allow for the additional inrush current.

Sleep States (ACPI)

The HP Netserver supports the ACPI (Advanced Configuration and Power Management Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the Netserver. The term “sleep state” refers to any of several reduced power consumption states in which normal NOS activity has ceased.

The Netserver supports several sleep states, including a sleep state with a short wake-up time, sometimes referred to as “standby” or “suspend” by various operating systems. In this sleep state the Netserver appears to be off, and is indicated by no display on the monitor and no activity for the CD-ROM or internal hard drives. However, the power LED is slowly flashing and the fans are operating.

An additional sleep state supported by the Netserver is one with a slower wake-up time, sometimes referred to as “hibernate” by various operating systems. In this sleep state, the Netserver appears to be off as mentioned earlier, but the fans and the power LED are also turned off. The unique feature of this sleep state (and the reason for its slower wake-up time) is that the Netserver's NOS state (applications running, screens open, etc.) just prior to hibernate has been saved to disk and must be restored from disk upon wake-up. However, this method of restoring the Netserver's operation is much faster than a complete rebooting of the Netserver. This method still requires running all the start-up self-tests before starting the NOS, but loading the NOS and all the previously opened applications is much faster.

The Netserver supports certain types of system activity, which is used as wake-up events from these sleep states. These wake-up events can be generated from the power button, LAN activity, and scheduled events.

NOTE The HP Netserver's power management policies (transitions between various power states) and the user options are specific to the particular ACPI-compliant NOS installed on the Netserver. If your respective NOS is ACPI-compliant, refer to the power management features in the instructions provided for more information.

The HP Netserver's power button can be configured to initiate a sleep state (Sleep button), a "soft off", or graceful shutdown of the NOS, rather than an immediate shutdown of the power supply. The power button configurations are dependent on the user interface provided by the ACPI-compliant NOS. While power management is under the control of the ACPI-compliant NOS, the HP Netserver's power button is capable of an override in case of a non-responsive NOS.

NOTE The HP Netserver power button will force a power down without waiting for the NOS to gracefully shut down the Netserver, if the power button is pressed and held in excess of four seconds.

CAUTION If the power button override is used, there is a strong possibility of corrupted or lost data.

2 System Information

Introduction

This chapter provides information on mass storage, connector pin-outs, accessory guidelines and system specifications.

Mass Storage

The HP Netserver LP 1000r comes standard with an IDE CD-ROM and a flexible disk drive. The Netserver will accept up to three Hot Swap SCSI hard disk drives (HDD) in special mounting tray adapters. At least one Hot Swap SCSI hard disk drive is required for booting the Netserver. An optional SCSI tape backup drive may be connected to the external SCSI connector at the rear.

Mass Storage Guidelines

- General Guidelines
  - ◊ Use care when unpacking and handling the SCSI disk drives.

    The hard disk drives are very susceptible to mechanical shock and can be easily damaged by a drop as short as one-quarter of an inch. If the drop would crack an egg, it will damage the drive.
  - ◊ Do not stack drives when out of the Netserver chassis.
  - ◊ The Netserver is internally limited to 5 mass storage bays.

    The flexible disk drive and CD-ROM drive, which are standard on all models of the HP Netserver LP 1000r, occupy bays 1 and 2 respectively.

    The three remaining bays, 3, 4, and 5 are reserved for Hot Swap SCSI hard disk drives (HDD).
  - ◊ If a backup tape drive is used, it must be connected externally using the external 68-pin SCSI connector at the rear of the Netserver.
- IDE Devices
  - ◊ The embedded IDE controller is an Enhanced-IDE dual channel controller and provides two connectors (IDE-1 and IDE-2) for IDE devices.
  - ◊ The IDE CD-ROM has only one connector on the cable from the primary channel (IDE-1) connector.
  - ◊ A secondary IDE connector (IDE-2) is available, but is not used.
- SCSI Device Selection
  - ◊ Use only HP LVD low profile (1 inch) SCSI 3.5-inch hard disk drives for the Hot Swap drive bays.
  - ◊ If mounting available SCSI drives in drive trays, ensure you use the mounting tray adapter recommended by HP, which is HP P2452A.

- ◊ Ensure the SCSI devices you install in Hot Swap bays do not have terminations installed. The Hot Swap backplane provides automatic termination for any unused bays. The HP Hot Swap SCSI drives come set without device ID or termination. Do not change these settings.
- ◊ Do not use high voltage differential (HVD) SCSI devices on either of the SCSI channels or damage will occur.
- ◊ The embedded dual-channel Ultra-3 SCSI controller includes connectors for SCSI channels A and B.
- ◊ Channel A is used for connection to the SCSI backplane board, which provides three 80-pin connectors for Hot Swap SCSI drives. The standard SCSI cable has one 68-pin, high-density connector for the SCSI backplane, which provides for automatic termination of the SCSI drives.
- ◊ Channel B is used to control external mass storage devices, including an external backup tape drive.

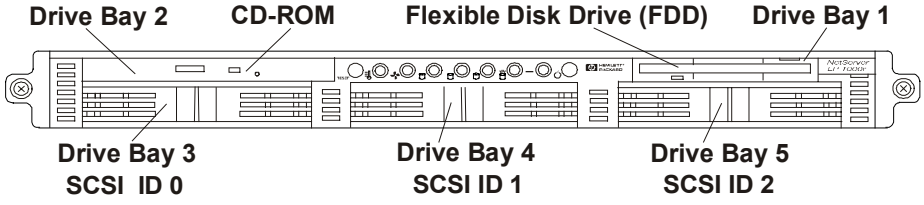
  Channel B is connected to the external 68-pin SCSI connector on the rear of the Netserver.

- SCSI Drive Addressing
  - ◊ The addresses of the SCSI drives are automatically assigned by the drive bay location in the chassis.

    No SCSI ID software settings or jumpers are required if using an HP NetRAID Controller board inserted into the only PCI slot.
- Automatic address assignment is also true for the three Hot Swap drive bays.

  The three Hot Swap bays support various SCSI HDD configurations.
  - ◊ Start from the left side of the chassis when adding Hot Swap SCSI hard drives in the HP Netserver.
- Filler Panels
  - ◊ Ensure all empty bays in the chassis have filler panels inserted before powering on the Netserver to ensure proper airflow. If there are empty bays, the existing drives and the Netserver may not receive the proper ventilation and could suffer thermal damage.

CAUTION	To prevent overheating or excessive electromagnetic radiation, use the filler panels to fill the empty bays. If the filler panels are left out of the drive bays, thermal damage and/or excessive EMI could occur.



HP Netserver Drive Bays

Boot Priority

The Netserver's boot order should be considered when selecting a boot device. This is especially important if you are installing a board that requires an early (lower) number in the boot order. The board's boot priority is set by its location in the boot order.

By default the Netserver searches for boot devices in this order:

1. IDE CD-ROM drive
2. Flexible disk drive
3. Embedded SCSI A channel (Hot Swap SCSI Drives)
4. Embedded SCSI B channel (external SCSI Devices)
5. PCI slot 1
6. Network connection

The embedded SCSI controller consists of two channels, A and B. Channel A is used to control the Hot Swap SCSI hard drives (3). Channel B is used to control the external SCSI devices. On each SCSI channel, the controller scans for a boot device starting at device ID 0 and works through the ID numbers. The Netserver's embedded controller is always SCSI ID 7.

NOTE The boot order can be changed using the Netserver's (BIOS) Setup Utility and the SCSI Select Utility.

Mass Storage Devices

Table 3-1 lists the number and types of mass storage devices that may be installed into the HP Netserver LP 1000r.

Table 3-1. SCSI Mass Storage Device Types

Interface Types	Max Number of Devices	Installed Devices and Addresses
Flexible disk drive	1	Factory installed flexible disk drive in drive bay 1
IDE-1	1*	Factory installed CD-ROM drive in drive bay 2 (Primary IDE connector)
Ultra-3 SCSI Channel A	up to 3 **	• Up to three Hot Swap SCSI hard disk drives may be installed in bays 3 through 5 (addresses = ID 0, ID 1 and ID 2, respectively) • Embedded SCSI controller (address = ID 7)
Ultra-3 SCSI Channel B	up to 15 **	• Control of up to 15 external SCSI devices

* The primary IDE (IDE-1) cable is connected to the factory-installed CD-ROM drive. A secondary IDE connector (IDE-2) is available, but is not supported by Hewlett-Packard.

** Both SCSI channels (A and B) can each support up to 15 devices; however, there are only enough internal storage bays for three Hot Swap SCSI hard drives. Channel B is used to control external SCSI devices, typically a SCSI tape back-up device.

Memory Guidelines

- The HP Netserver LP 1000r only uses 133 MHz (PC133) buffered SDRAM DIMMs, which are electrically different from the EDO and PC100 SDRAM memory modules used in other HP Netserver models.
- DIMMs sizes supported are 256 MB, 512 MB, or 1 GB in any combination.
- Supported memory capacity ranges from 256 MB to 4 GB maximum (1 GB in each of the 4 DIMM slots). The minimum capacity is 256 MB (one DIMM).
- DIMM sizes may be mixed on the system board and may be loaded in any order (0 through 3).

  However, HP recommends starting at slot 0 and filling the slots in order with the largest size first: 0, 1, 2, and 3.
- Open slots between DIMMs are permitted.
- When handling DIMMs, observe anti-static precautions to avoid damage.

To ensure you have the correct DIMMs before installation, refer to one of the following for a list of qualified DIMMs:

- HP Order Assistant on the HP web site at:

  http://www.hp.com/go/netserver
- HP Customer Service

Four MB of video memory is provided on the system board and cannot be upgraded.

Accessory Board Guidelines

The HP Netserver LP 1000r provides one 64-bit PCI slot connected to a riser board on the system board, which will handle a full-length 32-bit or 64-bit PCI accessory board.

Tested PCI Boards

For a list of tested PCI boards, check for compatibility under the Hardware Tested Products list for the HP Netserver LP 1000r under the Service and Support topic for the specific NOS used in the Netserver at HP's web site:

http://www.hp.com/netserver/support/compatibility

CAUTION	Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or limited power source limits and must use appropriate inter-connecting cabling in accordance with the National Electrical Code. (All HP boards comply with Class 2.)

IRQ Settings

The IRQ settings are automatically assigned and don't require user intervention. The HP Netserver uses the Plug-and-Play feature of the PCI boards to automatically assign resources. Technical Specifications

The specifications listed below vary if you install a mass storage device in your server that has more stringent environmental limits. Ensure the operating environment for your server is suitable for all of the mass storage devices being used.

Specifications

Environment

Temperature

Operating	5° to 35° C (41° to 95° F)
Non-operating	-40° to +65° C (-40° to +149° F)

Humidity

Operating	20% to 80% relative humidity, non-condensing
Non-operating	5% to 95% relative humidity, non-condensing

Altitude

Operating	-30 to 3,000 m (~ 10,000 ft)
Non-operating	-30 to 12,000 m (~ 40,000 ft)

Thermal Output

Maximum Operating	1007 BTU/hr

Weight and Dimensions

Specification	Value
Weight	32 lbs. (14.5 kg.) fully loaded (3 SCSI HDDs, 2 processors, and 4 DIMMs); excludes keyboard, mouse, and monitor.
Height	1.75 inches (44.5 mm)
Width	16.8 inches (428 mm)
Depth	23 inches (585 mm)

Video Display Modes

Resolution	Max. Refresh Rate @ 256 Colors	Max. Refresh Rate @ 65K Colors	Max. Refresh Rate @ 16.7M Colors
640x480	200 Hz	200 Hz	200 Hz
800x600	200 Hz	200 Hz	160 Hz
1024x768	150 Hz	150 Hz	120 Hz
1152x864	120 Hz	120 Hz	85 Hz
1280x1024	100 Hz	100 Hz	85 Hz
1600x1200	76 Hz	76 Hz	Not available

Power Supply Specifications

Parameter	Characteristics
Input Type	Universal Input
Input – Maximum Range	100 to 240 VAC at 50/60 Hz
Operating Current	2.6 Amps at 100 VAC 2.1 Amps at 120 VAC 1.3 Amps at 200-208 VAC 1.2 Amps at 230-240 VAC
In-rush Current	65 Amps
Operating Power AC Input DC Output	266 W maximum continuous power 189 W maximum continuous power

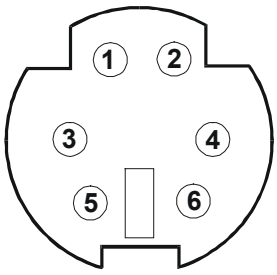
Hardware Specifications

Processors	Intel Pentium III (up to 2 processors) processors, at supported speeds of 866 MHz, 933 MHz and 1 GHz, with 256 KB level 2 cache on processor
Chipset	RCC LE chip set with 133 MHz bus speed support
Memory	Supports up to four SDRAM DIMMS for a maximum of 4 GB. Supported DIMM types: 256 MB, 512 MB and 1 GB unbuffered (registered), 72 bits wide, ECC single-bit correcting, multi-bit detecting.
Video	Supports up to 1600x1200, @ 65K colors, using an Embedded ATI Rage XL video chip with 4 MB SGRAM/SDRAM. Refer to "Video Display Modes" for more details.
SCSI	Embedded Symbios Ultra-160 SCSI dual channel controller; 160 MB/s transfer rate with two 68-pin connectors
IDE	Embedded Enhanced-IDE dual channel controller
LAN	Two Embedded Intel 82559 10/100 PCI Fast Ethernet Controllers; with Wake-on-LAN and Alert-on-LAN enabled/disabled via BIOS setup
PCI Bus	One 32/64-bit, 33 MHz speed, 5 volt PCI slot on riser board
I/O	One serial/management port and one bi-directional parallel port with ECP/EPP high-speed support; one PS/2 mouse, one PS/2 keyboard, and two USB connectors
CD-ROM	One Slimline CD-ROM drive; IDE interface; 24x speed

Connector Pinouts

Unless otherwise noted, the following features apply to all models. Some features are factory installed; others are optional.

Mini-DIN (PS/2) Connectors

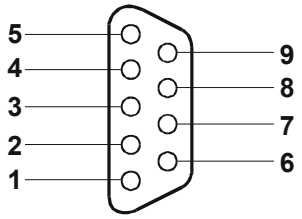


Mini-DIN Connector (female) for the Mouse and Keyboard

Mini-DIN Connector Pinouts for the Mouse and Keyboard

Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6	Not used

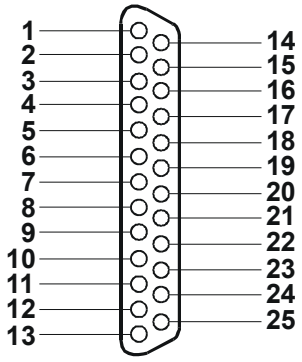
Serial Port Connector



Serial Port Connector (male) Pinouts

Pin Number	Signal Description
1	Data carrier detect
2	Receive data
3	Transmit data
4	Data term ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator

Parallel Port Connector

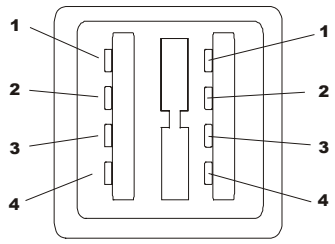


Parallel Port Connector (female) Pinouts

Pin Number	Signal Description	Pin Number	Signal Description
1	Strobe5	10	Acknowledge[b]
2	Data bit 06	11	Busy
3	Data bit 1[a]	12	Paper end
4	Data bit 2[a]	13	Select
5	Data bit 3[a]	14	Auto line feed[b]
6	Data bit 4[a]	15	Error1
7	Data bit 5[a]	16	Initialize printer[b]
8	Data bit 6[a]	17	Select in[b]
9	Data bit 7[a]	18-25	Signal ground

a. All data bits are sent to a printer in an 8-bit parallel format.
b. The signal is active low.

USB Connector



USB Connector

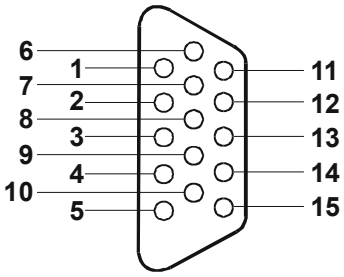
Universal Serial Bus Connector Pinouts

Pin Number	Signal Description
1	VBUS
2	D+
3	D-
4	GND

NOTE Use of the USB port is supported for printers, scanners, and external modems.

Video Connector

The built-in video uses the standard 15-pin analog display pinout configuration. The pinouts for your monitor may vary. For the pinouts for your monitor, refer to the manual provided with your monitor.

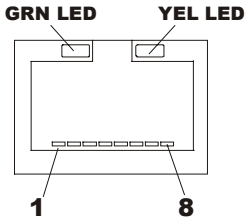


Video Connector

Video Connector (female) Pinouts

Pin Number	Function	Pin Number	Function
1	Red	9	Key (no pin)
2	Green	10	Sync return (ground)
3	Blue	11	Monitor ID bit 0
4	Monitor ID bit 2	12	Monitor ID bit 1
5	Monitor self test (ground)	13	Horizontal sync (+)
6	Red return (ground)	14	Vertical sync (-)
7	Green return (ground)	15	Not used
8	Blue return (ground)		

LAN Connector

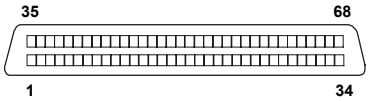


LAN Connector Pinouts

Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6-8	Not used

SCSI

There is one external SCSI connector on the back of the server.

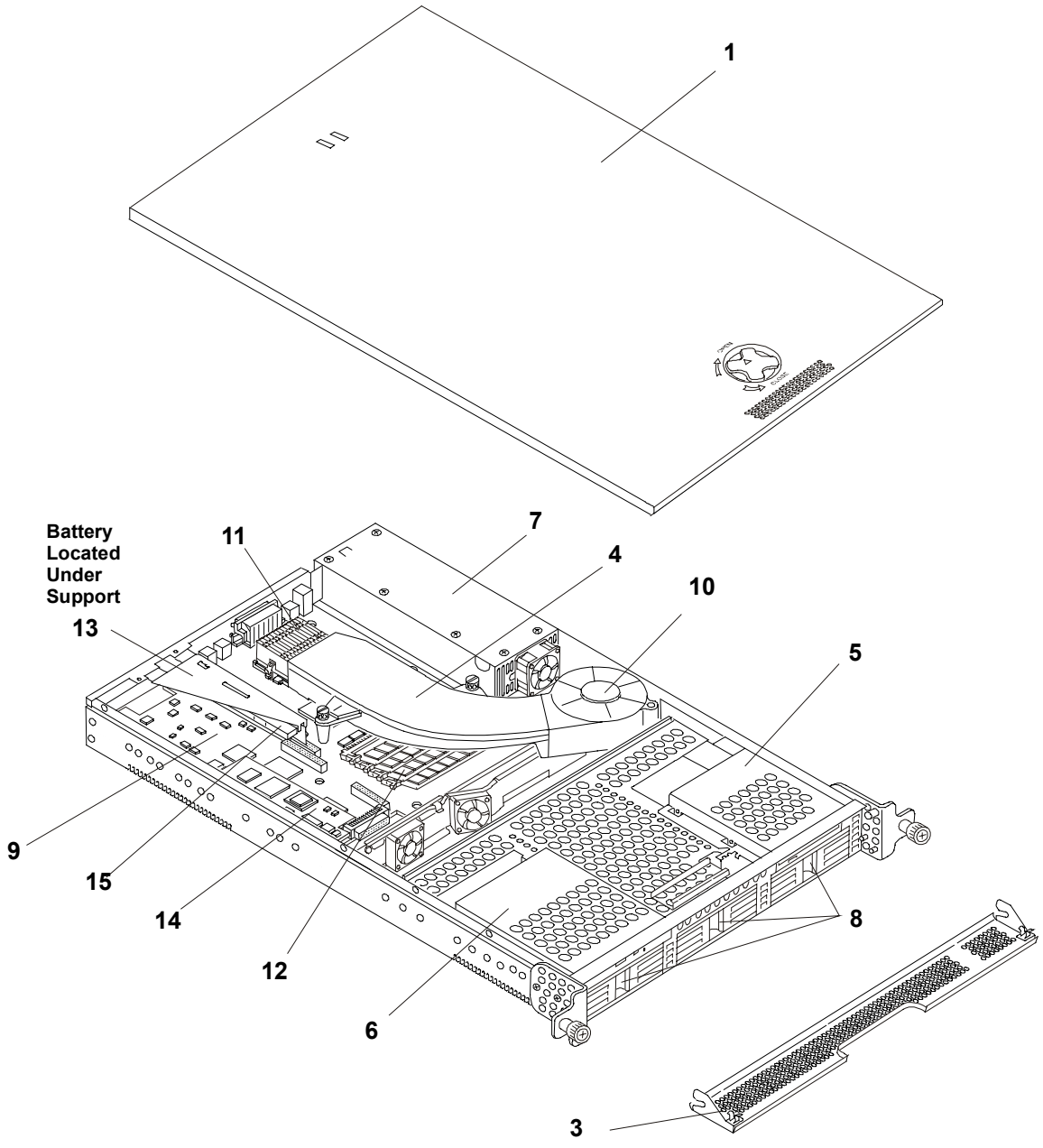


Wide SCSI Connector Pinout

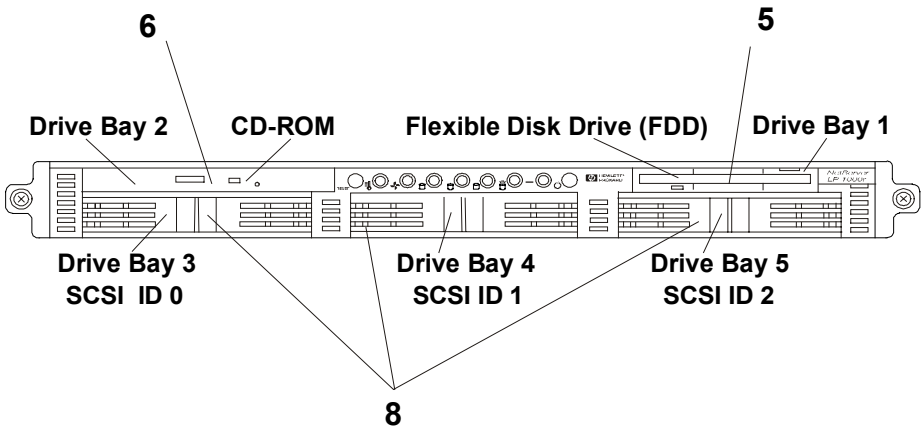
Pin	Signal	Pin	Signal
1	S1 (+DB 12)	35	S35 (-DB 12)
2	S2 (-DB 13)	36	S36 (-DB 13)
3	S3 (+DB 14)	37	S37 (-DB 14)
4	S4 (+DB 15)	38	S38 (-DB 15)
5	S5 (+DB P1)	39	S39 (-DB P1)
6	S6 (+DB 0)	40	S40 (-DB 0)
7	S7 (+DB 1)	41	S41 (-DB 1)
8	S8 (+DB 2)	42	S42 (-DB 2)
9	S9 (DB 3)	43	S43 (-DB 3)
10	S10 (+DB 4)	44	S44 (-DB 4)
11	S11 (+DB5)	45	S45 (-DB 5)
12	S12 (+DB 6)	46	S46 (-DB 6)
13	S13 (+DB 7)	47	S47 (-DB 7)
14	S14 (+DB P)	48	S48 (-DB P)
15	S15	49	S49
16	S16 (DIFFSENS)	50	S50
17	S17 (TERMPWR)	51	S51 (TERMPWR)
18	S18 (TERMPWR)	52	S52 (TERMPWR)
19	S19 (RESERVED)	53	S53 (RESERVED)
20	S20	54	S54
21	S21 (+ATN)	55	S55 (-ATN)
22	S22 S22	56	S56
23	S23 (+BSY)	57	S57 (-BSY)
24	S24 (+ACK)	58	S58 (-ACK)
25	S25 (+RST)	59	S59 (-RST)
26	S26 (+MSG)	60	S60 (-MSG)
27	S27 (+SEL)	61	S61 (-SEL)
28	S28 (+C/D)	62	S62 (-C/D)
29	S29 (+REQ)	63	S63(-REQ)
30	S30 (+I/O)	64	S64 (-I/O)
31	S31 (+DB 8)	65	S65 (-DB 8)
32	S32 (+DB 9)	66	S66(-DB 9)
33	S33 (DB 10)	67	S67 (-DB 10)
34	S34 (DB 11)	68	S68 (-DB 11)

3 Parts Information

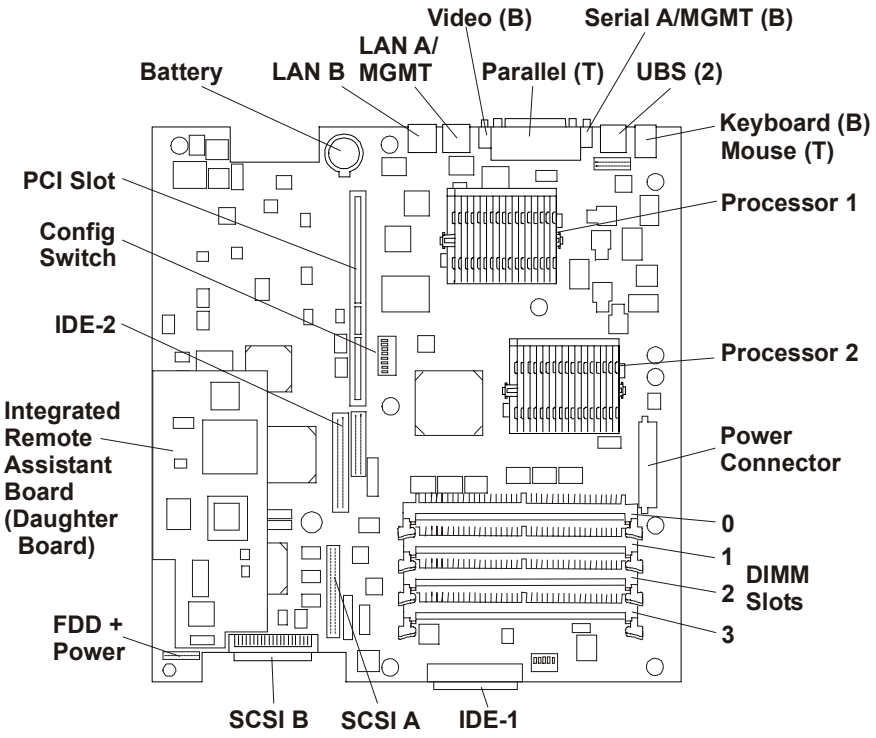
Exploded View – Cover and Bezel



Exploded View – Drives



Exploded View – System Board



Replaceable Parts List

The items in this list and the corresponding item numbers in the respective Exploded Views apply to both models of the HP Netserver, except where noted.

NOTE The part numbers listed below were available at the time of publication. Part numbers may change after publication. Order parts by the number listed below; HP's parts price list database will generally contain a reference to the revised part number. If a system board needs to be replaced, remove processor modules, DIMMs, or adapter boards and transfer these to the new board. Ensure all jumper and switch settings on the old board are transferred to the new board.

* This part is not on an exploded view

** This Part Number is revised with each new release

Item No.	Description	Replacement	Exchange
1	Top Cover	P1810-63006	N/A
2	Chassis Assembly, Core Box	P1810-63001	P1810-69001
3	Bezel	P1810-63002	N/A
4	Air Flow Guide	P1810-63020	N/A
5	Flexible Disk Drive, slim	P1810-63019	N/A
6	CD-ROM Drive 40x, slim	P1810-63018	N/A
7	Power Supply	P1810-63016	N/A
8a	9 GB HDD, LP, 10Krpm	P2472-63003	P2472-69003
8b	18 GB HDD, LP, 10Krpm	P2473-63004	P2473-69004
8c	18 GB HDD, LP, 10Krpm, hot swap	P2507-63005	P2507-69005
8d	36 GB HDD, LP, 10Krpm	P2474-63005	P2474-69005
8e	HDD Filler Panel	P1814-63022	N/A
9	System Board	P1824-63001	P1824-69001
10	Blower Fan	P1810-63013	N/A
11a	PIII/867 MHz, CPU and Heatsink/fan	P2453-63001	P2453-69001
11b	PIII/933 MHz, CPU and Heatsink/fan	P2467-63001	P2467-69001
12c	PIII/1 GHz, CPU and Heatsink/fan	P2468-63001	P2468-69001
11d	CPU Terminator	D9387-63016	N/A
12a	DIMM, 256 MB	D8266-63001	D8266-69001
12b	DIMM, 512 MB	D8267-63001	D8267-69001
12c	DIMM, 1 GB	D8268-63001	D8268-69001
13	Battery, 3V lithium	D8520-63012	N/A
14	Embedded Remote Assistant Card	P1824-63002	P1824-69002

Item No.	Description	Replacement	Exchange
15	PCI Riser Card	P1810-63005	
*	Cable, IDE CD-ROM	P1810-63007	N/A
*	Cable, IDE CD-ROM Connecting	P1810-63008	N/A
*	Cable, Internal to External SCSI	P1810-63009	N/A
*	Cable, Flexible Disk Drive	P1810-63010	N/A
*	Cable, I2C	P1810-63011	N/A
*	Assy, Wire Front Panel LED	P1810-63012	N/A
*	Technical Reference Card	P1810-80206	N/A
	HP Navigator CD-ROM	D9387-xxxx	N/A
	SCSI Adapter	D5025-63001	N/A
	10/100TX LAN Adapter	D5013-63001	N/A
	NetRAID 1si DAC	D2140-63001	N/A
	NS Fiber Channel HBA	D8602-63001	N/A

Keyboards

Language	Part Number	Language	Part Number
US	D4950-63001	Danish	D4950-63016
Arabic/French	D4950-63025	French Canadian	D4950-63002
Portuguese	D4950-63027	German	D4950-63003
Cyrillic	D4950-63030	Spanish	D4950-63004
Belgian/Flemish	D4950-63014	French	D4950-63005
Italian	D4950-63017	Norwegian	D4950-63009
Arabic/English	D4950-63020	Swiss	D4950-63011
Korean/Hangu	D4950-63021	Swedish	D4950-63012
Taiwan	D4950-63023	UK	D4950-63013
Polish	D4950-63035	Czech	D4950-63036
Hungarian	D4950-63037	Greek	D4950-63032
Turkish	D4950-63035	Dutch	D4950-63006

Power Cords

Country	Part Number	Country	Part Number
Australia/New Zealand	8120-1369	India/South Africa	8120-4211
Canada/United States	8120-1751	Japan	8120-4753
Denmark	8120-2956	Switzerland	8120-2104
Europe	8120-1689	United Kingdom	8120-1351

Cables and Part Numbers

Cable	Description	Replacement Part Nos.
	Internal SCSI Cable w/connectors and termination	D9387-63005
	IDE CD-ROM Cable	D9387-63004
	Flexible Disk Cable	D7140-63006
	Internal/External SCSI Cable w/two connectors	D9387-63006
	Internal SCSI Cable w/three connectors and termination	D9387-63007

4 Diagnostics

Diagnostic Tests

When the server boots, a series of tests are displayed on the screen. The number of tests displayed depends on the configuration of the server. The following are the kinds of errors a user might get with the HP Netserver.

- Built-in diagnostic Error Messages.
- BIOS and other error messages. These are errors detected by the system BIOS outside the built-in diagnostics or application errors.

To see the Power On Self-Tests (POST):

- The HP Netserver must be functionally able to run the diagnostics.
- The video subsystem must be functional.
- The keyboard must be functional.

NOTE	BIOS ROM version number is displayed on the monitor screen during power-up.

Diagnostics Description

The diagnostics (Power-On Self-Test "POST") run automatically each time the Netserver is powered on. These diagnostics, which reside in the BIOS ROM, isolate server-related logic failures and indicate the board or component that needs to be replaced, as indicated by the Error Messages. Most Netserver hardware failures will be accurately isolated by the diagnostic

WARNING	You should always turn off the power and disconnect the power cord to the Netserver before attempting to remove the cover and touch the internal components. Failing to do so can expose you to electric shock and the server's components to damage. The power switch does NOT turn off standby power, so disconnect the power cord to turn off standby power.

HP Netserver DiagTools

The purpose of hardware diagnostic software is to provide tools for checking hardware problems. By design, diagnostic software executes simple tests of each hardware component. Usually, such tests assure that hardware is not the source of Netserver problems. This allows the user to eliminate hardware as the cause of the problem and to focus on operating system configuration parameters, network connections, and application software configuration parameters as the source of the problem.

If hardware problems are confirmed, the diagnostic software program can sometimes detect and diagnose the subsystem or specific Netserver component causing of the problem. In addition, diagnostic tools can capture information that allows support personnel to quickly assess the condition of the Netserver.

In order to be effective, diagnostic software tools must be used in the context of a wider troubleshooting

procedure.

DiagTools Capabilities

DiagTools for HP Netservers is a set of off-line diagnostic tests, including tests for system and processor components, memory and storage elements, ports, and input/output devices. DiagTools is supplied on the *HP StartUp CD-ROM*.

The user prepares DiagTools software for use by transferring it to diskette. Then the DiagTools diskette is used to boot the server. A basic suite of tools checks key Netserver components, and a menu of advanced tests is available for in-depth testing.

DiagTools has the ability to test the following components:

- system board
- memory modules
- flexible disk drives
- parallel ports
- video monitor
- processors
- hard disk drives
- keyboards
- CD-ROM drives

DiagTools is an off-line diagnostic. Off-line diagnostics do not use the main operating system (OS) of the HP Netserver. The alternate DiagTools OS has far fewer features than the full-fledged OS. Thus, its capabilities are limited to a set of basic tests and a series of advanced tests. In addition, DiagTools does not use any tests, which might write over and thus destroy user data. Tests that require user inputs or decisions are left to the advanced series of tests.

You can use DiagTools to perform the tasks listed below:

- display a high-level inventory of the Netserver under test
- save and print a detailed inventory of hardware components
- conduct a basic test of components listed in the Netserver inventory
- display “PASSED” or “FAILED” overall results of basic tests
- record detailed test results of basic Netserver tests
- display a menu of advanced tests
- select and run one or a series of advanced tests
- add the record of results of advanced tests to the record of basic tests
- view a list to locate the meaning of a specific error code
- view one or more steps to help confirm and isolate error conditions
- browse the Support Ticket, which contains the detailed inventories and test results
- add comments to the Support Ticket

About Error Messages

A hexadecimal number designates each error message reported by DiagTools; a short note on the type of error; and a list of one or more steps the user can take in response. When you run a test, it exercises many

aspects of the hardware, so the number of possible error messages exceeds 300. Most of these are encountered rarely, if ever.

Error codes can be viewed on line from the DiagTools User menu within the advanced series of tests, or you can refer to Chapter 3 of the *HP Netserver DiagTools Error Reference and User Guide*.

Advantages and Limitations of Hardware Diagnostics

Off-line diagnostic software is useful in making sure that hardware has been eliminated as the cause for possible Netserver problems. Such diagnostic tools can easily be shipped with a server, and they are relatively easy to use.

Only experienced personnel knowledgeable of its limitations should use off-line diagnostic software.

Some limitations are:

- booting the Netserver from the diagnostics diskette
- no access to operating system error logs, since the OS is not operating at the same time as the diagnostic tools
- limited ability to test only a single component at a time
- inability to indicate problems with wrongly configured Netservers or the network

Introduction

If you are having problems installing your HP Netserver, there are a number of different tools available for troubleshooting, including the information provided in the following topics in this chapter.

- *HP Netserver Online Documentation CD-ROM* contains the following information in the *HP Netserver LP 1000r Service Manual*:
  - ◊ Troubleshooting Information
  - ◊ Parts Information
  - ◊ List of Error Messages
  - ◊ List of Beep Error Messages
- Navigator CD-ROM provides several utilities for troubleshooting purposes.

  At the Main Menu, select "Netserver Utilities" to use the following tools:
  - ◊ Diskette Library - A collection of diskette images representing drivers, utilities and BIOS updates, which enables you to conveniently generate any flexible diskette available on the *HP Netserver Navigator CD-ROM*. For example, you can create the following diskettes: BIOS Update and NOS Drivers.
  - ◊ HP DiagTools Utility - An easy-to-use hardware diagnostic for Netserver verification, burn-in, and rapid troubleshooting. Use this icon to copy DiagTools to two (2) flexible diskettes from the *HP Netserver Navigator CD-ROM*, and then execute from the flexible diskette.

Tools Required

Check the documentation provided with the NOS and accessory boards for additional tool requirements.

- Torx® T-15 driver
- ¼-inch flat blade screw driver

Common Installation Problems

The following sections contain general procedures to help you locate installation problems. If you need assistance, HP recommends contacting your reseller first. If you need to get assistance from Hewlett-Packard, refer to Warranty and Support document provided with the Netserver.

WARNING	Before removing the cover, always disconnect the power cord and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

Troubleshooting Sequence

To troubleshoot problems during installation, do the following:

- First, ensure the HP Netserver is configured properly.

  Most Netserver problems are the result of incorrect Netserver and SCSI configurations.
- Verify all cables and boards are securely plugged into the appropriate connectors or slots.
- If it is a network-related error, determine if the Netserver has enough memory and hard disk drive capacity.

  Refer to the network operating system (NOS) manual.
- Remove all added options to ensure you have isolated the problem to basic Netserver or its options.

  Always replace one option, and only one option, at a time.

NOTE	If the Netserver has a large amount of memory installed, it may take 30 seconds for the first screen to display.

Netserver Will Not Power On

Follow these steps if the power/activity light does not light green after you press the power-on button, or the Netserver will not power on properly.

NOTE	If the heatsink is not properly installed on the processor or the cooling fan is not connected to the fan power connection, the Netserver will automatically shut down within 10 seconds and provide no error messages, error codes, beep codes, or video display.

1. Remove the AC power cord, wait 15 seconds, reconnect the power cord, and try again.
2. Ensure all cables and the power cord are firmly plugged into the proper receptacles.
3. If the Netserver is plugged into a switched multiple-outlet box, ensure the switch on the outlet box is turned on.
4. Plug a different electrical device (such as a printer) into the power outlet, and turn it on to verify if the fault is with the power supply.
5. Verify the power supply is connected to the system board.
6. Verify the front power switch is connected to the system board.

Problems after Netserver is Powered On

If you think it is a hardware error, follow these steps and refer to "Hardware Problems" later in this chapter.

1. Log users off the network and power down the HP Netserver.
2. Remove the Netserver's cover.

WARNING	Before removing the cover, always unplug telephone cables and disconnect the power cord. Unplug telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

2. Simplify the HP Netserver configuration to the required minimum, removing all third-party options.

   For example, reduce the Netserver to the monitor, one flexible disk drive, one CD-ROM drive, one SCSI hard disk drive, keyboard, mouse, and one NIC.
3. Power on the Netserver to start the boot process.
4. If the Netserver will not complete the boot process:
   a. Consult the troubleshooting steps in the section "Hardware Problems" later in this chapter.
   b. If you get an error message or beep code, refer to the following section "Error Messages".
   c. Clear the CMOS memory and reboot.

      Refer to "Clearing the CMOS Configuration" later in this chapter.
5. If you have completed a boot of the Netserver successfully, reinstall the third-party options one at a time, checking the Netserver after installing each option.

Error Messages

There are three kinds of error messages; two types appear during the POST process and the third is not a visual message, but an audible message (beep codes). Any one of these three types of error messages could point to a problem which might prevent the Netserver from completing the boot process. These are:

- Error messages (reverse video) – These text messages display in black text on white background and can provide more information on screen.

  Press the [Enter] key to see a definition of the message and what action to take to remedy the problem. A sample of these messages appear in Table 4-1.

- Power-on self test (POST) codes - These display in normal video (white text on black background) and may be a text message or an alpha numeric code. If an error with a text message occurs during the POST, details of the error are displayed. Follow the instructions on the screen. If an alpha-numeric code appears, refer to Table 4-2 later in this chapter.
- Beep Codes – These are series of audible beeps, which occur during the boot process before the video display can initialize allowing the visual messages of the POST routines to appear. Refer to the Table 4-3 later in this chapter

No Error Messages Displayed On Screen

General Checks:

1. Listen for beep codes.

   If you hear a series of beeps refer to Beep Codes in Table 4-3 later in this chapter.

   If no beep codes are heard, continue with the next step.
2. Verify all external cables and power cables are firmly plugged in.
3. Verify the power outlet is working.
4. Verify the Netserver and monitor are turned on.

   The power-on indicator should be illuminated.
5. Verify the display's contrast and brightness settings are correct.
6. Verify all internal cables are properly connected and all boards firmly seated.
7. Verify the processor and its heatsink are fully seated in its socket on the system board.
8. Verify the DIMMs are installed correctly and fully seated.
9. Verify the DIMM notches are aligned to the keys in the DIMM connector.

After Installing an Accessory:

1. Turn off the monitor, the Netserver, and any external devices.
2. Unplug all cables from the power outlet.
3. Remove the cover.
4. Check the following:

   ◊ If you have installed an accessory board, verify the board is firmly seated in its slot and any switches or jumpers on the accessory board are properly set.

   Refer to the documentation provided with accessory board.

   ◊ Check all internal cabling and connections.

   ◊ If you have changed any switches on the system board, verify each one is properly set.

NOTE	Only two of the eight switches on configuration switch are used.

5. Replace the cover and connect all cables.
6. Turn on the monitor and Netserver.
7. If the Netserver still does not work:

   ◊ Repeat steps 1, 2, and 3 of this section.

- ◊ Remove all accessories, except the primary boot hard disk drive.
- ◊ Replace the cover and connect all cables.
- ◊ Turn on the monitor and the Netserver.
- ◊ If the Netserver now works, replace the boards and accessories one at a time to determine which one is causing the problem.

8. If the Netserver still does not work contact your service representative to replace the Netserver.

POST Error Messages

If you get a POST text error message in reverse video, press the [Enter] key (View System Error) to get a more detailed explanation and a possible solution.

If the Netserver starts, but POST still reports an error message, clear the CMOS configuration, as described later in this chapter.

NOTE	HP recommends you correct the error before proceeding, even if the Netserver appears to start successfully.

Table 4-1 describes the typical POST text error messages and the corrective action you may take to remedy the problem.

Table 4-1. POST Error Messages

Message	Corrective Action
Operating system not found	• Verify the desired boot drive has power and its SCSI cable connected. • Verify the SCSI cable is securely plugged into the SCSI connector on the system board. • Verify the boot device is enabled in the **Setup Utility** under the Security menu. • Verify the boot device has an operating system installed. If the problem persists, contact your HP support organization.
Keyboard error (The LP 1000r will complete the boot process without a keyboard connected.)	• Verify the keyboard is connected to the correct connector (not the mouse connector) at the rear of the Netserver. If the problem persists, replace the keyboard or contact your HP support organization.
Mouse error (The LP 1000r will complete the boot process without a mouse connected.)	• Verify the mouse is connected to the correct connector (not the keyboard connector) at the rear of the Netserver. If the problem persists, replace the mouse or contact your HP support organization.

Message	Corrective Action
If no message appears (screen is blank)	• If no text or messages appear listen for the beep codes. Refer to Beep Codes in Table 4-3. • If no message appears but the Netserver stops after POST, verify the DIMMs are correctly installed.
If a configuration error occurs	If a Netserver configuration error is reported during the startup routine, clear the CMOS memory as described under "Clearing the CMOS Configuration," and restart the Netserver.
System CMOS checksum bad	• Press **[F2]** to run Setup. • Change settings as required. • Choose the Exit option, selecting Save Changes and Exit to save the new settings. The Netserver should reboot.

Power-On Self Test (POST) Error Codes

These error codes (POST codes) appear in normal video if an error condition occurs during the boot process of the HP Netserver LP 1000r. All the codes and the respective descriptions are listed in the *HP Netserver LP 1000r Service Manual*, but not all the codes apply to this Netserver. The service manual is also located on the *HP Netserver Online Documentation CD-ROM* provided with the HP Netserver.

These codes will appear on the display monitor, provided it and the supporting circuitry are functioning:

NOTE Do not take remove/replacement actions until you have taken other troubleshooting steps. See the troubleshooting checklist.

Table 4-2. POST Error Codes

Code	Description	Problem/Solution
0000	System Board error	POST has detected a failure limited to the system board internal functions. To verify this error: 1. Reboot the Netserver. Skipping this error message and continuing may result in unstable behavior, or a system hang during the boot process. 2. If this error continues, the system board may need to be replaced. Contact your service representative to replace your Netserver.
0010	BIOS problem	The PC configuration has been lost, cleared, corrupted, or has not been initialized. When the HP Netserver remains unplugged for a long period of time, the battery will discharge and not provide enough current to keep the CMOS memory powered. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery as described later in this chapter. 3. Run the **Setup Utility** to re-configure your Netserver.
0011	Battery problem	The Netserver BIOS is not responding due to a possible battery discharge. If the HP Netserver was unplugged for a long period of time, the battery will discharge and not provide enough current to keep the system date and time current. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery. 3. Set time and date using the **Setup Utility** and in your operating system, if necessary.
0012	BIOS initialization problem	The HP Netserver configuration has been cleared or has not been initialized. Run the **Setup Utility** to re-configure your Netserver.
0020	ISA initialization problem (This does not apply to LP 1000r)	The ROM on the accessory board is bad or the board has a conflict with a system board reserved resource (address, DMA, or IRQ). To correct this: 1. Change the resources used by the ISA accessory boards. 2. Try to disable <free> resources used by system board devices. 3. If the problem persists, the accessory board may be

Code	Description	Problem/Solution
		defective. Contact the accessory board vendor.
0021	PCI Configuration conflict	A configuration problem has occurred with a PCI device. The PCI device or accessory board doesn't match PC setup settings or has conflicts with PC resources (reserved memory space, IRQ or DMA channels). To correct this: 1. Clear the PCI configuration with the Configuration switch. Refer to " Clearing the CMOS Configuration." 2. If necessary, use the **Setup Utility** to manually configure the PCI devices. 3. Check for any further PC resource, which can be used. Use **Setup Utility** to disable any unused function, such as I/O ports or IDE controllers. 4. Start the Operating System and let it update the PCI configuration.
0022	Plug & Play ISA initialization problem (This does not apply to LP 1000r)	The Plug & Plug ISA accessory board has reported an initialization problem. The ROM on the accessory board is bad or the Plug & Play BIOS cannot solve a conflict issue with a system board reserved resource. To correct this: 1. Clear the Plug & Play configuration with the CMOS status switch. Refer to the User's guide for details. 2. Try to disable (free) resources used by system board devices. 3. Run the Plug & Play utility supported by your Operating System. 4. If the problem persists, the accessory board may be defective. Contact the accessory board vendor.
0030	Processor Speed selection problem (This does not apply to LP 1000r.)	POST has detected the processor speed selected with system board switches does not match the processor's speed.
0040	PC Serial Number initialization problem (This does not apply to LP 1000r – The system serial number is entered in the manufacturing process and stored in	POST has detected the PC Serial Number has been lost or has not been initialized. Pressing **[F2]** will automatically run the HP Serial (BIOS) Utility and allow you to enter the Serial Number.

Code	Description	Problem/Solution
	the system FRU data.)	
0050	Processor Cooling/ Heating problem	POST has detected a cooling fan problem. The processor cooling-fan needs to be connected or it is not turning fast enough to cool the processor. The system board circuitry monitors the speed of all the fans.
0076	Integrated HP NetRAID processor is not responding. (This does not apply to LP 1000r)	This problem will prevent the operation of the Integrated HP NetRAID, if it is enabled. The problem may also prevent operation of some PCI slots. 1. Flash the Integrated HP NetRAID firmware and reboot the system. 2. If the error persists, your I/O board may need to be replaced. Contact your service representative.
0100	Keyboard error during POST	A key on the keyboard has been pressed during POST of the HP Netserver. To correct this: 1. Ensure nothing is put on the keyboard and no key is accidentally pressed down. 2. Reboot the Netserver. 3. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0101	Keyboard error (The LP 1000r will complete the boot process without a keyboard connected.)	The keyboard has reported an error during its self-test. To correct this: 1. Restart your HP Netserver. 2. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0102	Keyboard controller error during POST	POST has detected a general failure in the integrated keyboard controller. To verify this error: 1. Restart your HP Netserver. 2. If the error persists, your system board may need to be replaced. Contact your service representative to replace your Netserver.
0103	Keyboard is not connected. (The LP 1000r will complete the boot process without a keyboard connected.)	POST has detected the keyboard is not connected. To correct this: 1. Verify the keyboard connector is firmly connected. 2. Reboot the Netserver. 3. If the problem persists, your keyboard cable may be damaged or your keyboard may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0105	Mouse boot error (The LP 1000r will complete the boot process without a mouse connected.)	The system board has detected a mouse error during POST. To correct this: 1. Clean the mouse and its moving ball as described in the User's Guide. 2. If the problem persists, your mouse may need to be replaced. Contact your service representative.
0106	Mouse is not responding. (The LP 1000r will complete the boot process without a mouse connected.)	The system board has detected the mouse is not responding. To correct this: 1. If the mouse has just been removed, press **[Esc]** to automatically validate the change. 2. Otherwise, verify the mouse connector is firmly connected. 3. If the problem persists, your mouse may need to be replaced. Contact your service representative.
0108	Mouse and Keyboard reversed	POST has detected the mouse and keyboard connections are reversed. To correct this: 1. Turn the Netserver off. 2. Swap the mouse and keyboard connections. 3. Turn on the Netserver power and reboot the Netserver.
0200	Serial Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between one of the integrated serial port controllers and an accessory board. To correct this: 1. If an integrated serial port is not needed, run the **Setup Utility** and disable the related serial port. 2. If the integrated serial port is needed and its settings cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0201	Parallel Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between the integrated parallel port controller and an accessory board. To correct this: 1. If the integrated parallel port is not needed, run the **Setup Utility** and disable the parallel port. 2. If the integrated parallel port is needed and its settings

Code	Description	Problem/Solution
		cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0300	Flexible disk drive (A) boot error	POST has detected the flexible disk drive (A) reported an error during its self-test. To correct this: 1. Verify a diskette can be properly inserted and removed from the flexible disk drive. 2. Verify the flexible drive type configured in the **Setup Utility** matches the flexible disk drive installed in the HP Netserver. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative to replace your Netserver.
0301	Flexible disk drive B boot error (This does not apply to LP 1000r)	POST has detected the flexible disk drive B reported an error during its self-test. 1. Verify a diskette can be properly inserted and removed from the flexible disk drive. 2. Verify the flexible drive type configured in the **Setup Utility** matches the flexible disk drive installed in the HP Netserver. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.
0305	Flexible Disk Drive Cable conflict (This does not apply to LP 1000r)	The flexible disk drive A is connected to the connector configured for flexible disk drive B. 1. Run **Setup Utility** by pressing **[F2]**. In the flexible disk drive section, enable the A & B flexible disk swap. 2. Alternatively, if the connector allows it, connect the flexible disk drive to the other connector on the flexible disk drive cable.
0306	Flexible disk drive controller boot error	POST has detected a general failure on the integrated flexible disk controller. To verify this: 1. Restart your HP Netserver. 2. If the error persists, your system board may need to be replaced. Contact your service representative to replace your Netserver.
0307	Flexible disk drive	POST has detected an address space or IRQ resources conflict

Code	Description	Problem/Solution
	controller resource conflict	between the integrated flexible disk controller and an accessory board. To correct this: 1. If the integrated flexible disk controller is not needed, run the **Setup Utility** and disable the flexible disk controller. 2. If the integrated flexible disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0400	CD-ROM boot error	POST has detected the CD-ROM drive has reported an error during its self-test. To correct this: 1. If a CD-ROM disk is present, verify it is correctly inserted. 2. Verify the CD-ROM drive door or tray has not been opened or closed during the self-test. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative to replace your Netserver.
0401	CD-ROM drive not responding	POST has detected the CD-ROM drive is not responding, but is configured in the **Setup Utility**. To correct this: 1. If the CD-ROM drive has just been removed, press **[F4]** to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available. The **Setup Utility** and the 32-bit disk access driver may need to be modified accordingly. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative to replace your Netserver.
0500	Hard Disk (primary) controller boot error (This does not apply to LP 1000r)	POST has detected a general failure on the integrated (primary) hard disk controller. To correct this: 1. Restart your HP Netserver. 2. If the error persists, your system board may need to be replaced. Contact your service representative to replace your Netserver. 3. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with the secondary

Code	Description	Problem/Solution
		controller. Verify the secondary IDE controller is enabled in Setup. 4. If the IDE device operates with the secondary channel, your system board may need to be replaced to recover primary channel functionality. Contact your service representative to replace your Netserver. 5. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative to replace your Netserver.
0501	Hard Disk secondary controller boot error (This does not apply to LP 1000r)	POST has detected a general failure on the integrated secondary hard disk controller. 1. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with the primary controller. Verify the primary IDE controller is enabled in Setup. 2. If the IDE device operates with the primary channel, your system board may need to be replaced to recover secondary channel functionality. Contact your service representative to replace your Netserver. 3. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative.
0510	Hard Disk boot Error Error codes #0510, #0511, #0512, and #0513 apply to IDE0, IDE 1, IDE 2, and IDE 3 respectively as described in the **Setup Utility**). (This does not apply to LP 1000r)	POST has detected the specified hard disk drive reported an error during its self-test. To correct this: 1. Check the hard disk drive configuration with the **Setup Utility**. 2. If necessary, edit the user hard disk parameters to set lower values. 3. If the problem persists, your drive may need to be replaced. Contact your service representative.
0520	Hard Drive not responding (Error codes #0520, #0521, #0522, and #0523 apply to HDD0, HDD1, HDD2, and HDD3 respectively as described in the **Setup Utility**). (This does not apply to LP 1000r)	POST has detected the specified hard disk drive is not responding, but is configured in the **Setup Utility**. To correct this: 1. If the specified hard disk has just been removed, press **[F4]** to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available. 4. If the problem persists, your hard disk drive may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0530	Hard Disk drive connection problem The IDE cable (primary channel) marked IDE cable <#0530>. The secondary channel cable marked IDE2 <#0531> (This does not apply to LP 1000r)	POST has detected a hard disk drive on the second <slave> position on the IDE cable, but no hard disk has been found on the first <master> position. To correct this: 1. If only one hard disk is connected on the cable, disconnect the hard drive and use the other connector to re-connect the hard drive into the first <master> position. 2. If two disks are connected on the cable, verify all data cables and power cables are firmly connected for both hard disk drives. 3. If the error message appears just after a hard disk drive installation, check for master/slave specific jumper configurations in the hard disk drive installation manual. 4. If the problem persists, the hard disk drive may need to be replaced. Contact your service representative.
0540	Hard Disk Controller resource conflict (This does not apply to LP 1000r)	POST has detected an address space or IRQ resource conflict between the integrated hard disk controller and an accessory board. To correct this: 1. If the integrated hard disk controller is not needed, run the **Setup Utility** to disable it (primary or secondary). 2. If the integrated hard disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0600	Video Memory boot error	The video memory size detected during POST is smaller than previously detected. (This would apply if the embedded video circuitry was defective, or a video adapter board were installed into LP 1000R to increase the video speed and memory.) To correct this: 1. If you have changed to a video adapter board, press **[F4]** to automatically validate the change. 2. If the problem persists, the system board or video board may need to be replaced. Contact your service representative.
0700	DIMM size boot error	POST has detected system memory size is smaller than previously detected. At least one or several DIMMs are disconnected, or have been replaced by smaller ones. To correct this: 1. If some DIMMs have just been removed or replaced by smaller ones, press **[F4]** to automatically validate the change.

Code	Description	Problem/Solution
		2. If no DIMM has been removed or changed, ensure all DIMMs are properly inserted in the slots. 3. If the problem persists, one of DIMMs may need to be replaced. Contact your service representative.
0712	DIMM installation error	POST has detected an incorrectly installed DIMM or the failure of one or more DIMMs. To correct this: 1. If additional memory was just installed in your Netserver, please verify the installation conforms to the description in the User's Guide. 2. If this error was reported when no additional memory was just installed, restart the Netserver. 3. If the error persists, contact your service representative.
0713	Incorrect DIMM installed	POST has detected one or more DIMMs are not the correct type, or the correct speed. To correct this: 1. If additional memory was just installed in your Netserver, please verify the correct DIMM type and speed for this Netserver was installed. Refer to the DIMM description in the User's Guide. 2. If this error was reported and no additional memory was just installed, restart the Netserver. 3. If the error persists, contact your service representative.
0800	Cache memory size error	POST has detected the cache memory size is smaller than previously detected. To correct this: 1. If the processor has just been replaced, press **[F4]** to automatically validate the change. 2. If the problem persists, the processor may need to be replaced.
0801	Cache boot error	POST has detected an error in the cache memory module. To correct this: 1. Verify the processor is installed correctly. 2. If the problem persists, the processor may need to be replaced. Contact your service representative.
0900	Integrated LAN disable error	The system could not disable the integrated LAN. To correct this:

Code	Description	Problem/Solution
		1. Reset the Integrated LAN by powering off the HP Netserver. 2. Disconnecting the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP Netserver. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on HP Navigator CD-ROM. 6. If the error persists, the system board may need to be replaced. Contact your service representative to replace your Netserver.
0901	Integrated LAN enable error	The system could not enable the integrated LAN. To correct this: 1. Reset the Integrated LAN by powering off the HP Netserver. 2. Disconnecting the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP Netserver. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on HP Navigator CD-ROM. 6. If the error persists, the system board may need to be replaced. Contact your service representative to replace your Netserver.
0A00	Display refresh rate error	The parameters returned by the display do not match the DDC standard used by the Netserver for automatic setup of ergonomic refresh rates. To correct this: 1. Disable the 'Plug & Play Display' feature in the **Setup Utility** to avoid a blank or unreadable screen at power-up. 2. Use the **Setup Utility** to manually set the video refresh rates to the highest ergonomic refresh rates supported by the display. Refer to the display monitor's User Guide for specifications.
0B3x	Processor conflict	POST has detected the processors installed in the Netserver are not the same type or speed. To correct this: 1. Ensure both processors in the Netserver have the same product code, which should include the type, heat sink, and speed. 2. If not, replace one or both to ensure both are the same product code. Contact your service representative.

Code	Description	Problem/Solution
		This problem must be corrected to avoid possible malfunction or reliability problems.

Beep Codes

If the POST routines cannot display messages when an error occurs before the video display is initialized, the Netserver emits a series of beeps. If you get a blank screen on boot, but hear beeps, refer to the table below to interpret the meaning of the beeps.

Beep Codes for Fatal Errors

P = Check and replace processor
S = Check and replace system board +
M = Check and replace memory modules
R = Replace ROM chip +

Note: + If this occurs, contact your service representative to replace your Netserver LP 1000r.

Table 4-3. Beep Code List

Beep Code	Test Failure	I/O port 80H	Repair
1-3-1-1	Test DRAM refresh	20	S, P
1-3-1-3	Test 8742 Keyboard Controller	22	S, P
1-3-3-1	Test DRAM	28	M
1-3-4-1	Test 64K base address lines	2C	M, P
1-3-4-3	Test 64K base memory	2E	M, P
1-4-1-1	Test 64K base memory (upper 16 bits)	30	M, P
2-1-2-3	Copyright checksum	46	R

If you still don't see anything on screen, perform the following steps in order:

1. If you press **[F1]** and nothing happens, confirm the following:
   - ◊ The keyboard cable is properly connected to the keyboard and the keyboard port.
   - ◊ The keyboard is not locked, and network server mode is not enabled. (If either the keyboard lock or network server mode was enabled in the **Setup Utility**, type in the password.)
2. If the Netserver beeps several times and does not display an error message, the Netserver has experienced a fatal POST error. If this happens, refer to the Beep Code table for the symptom:
3. Turn off the Netserver, unplug the power cord, and do the following:
   - ◊ Remove and reinsert the only PCI accessory board firmly in the slot.
   - ◊ Remove and reinsert the processor(s) firmly in the sockets on the system board.
   - ◊ Remove and reinsert the DIMMs firmly and correctly in the slots.

Clearing the CMOS Configuration

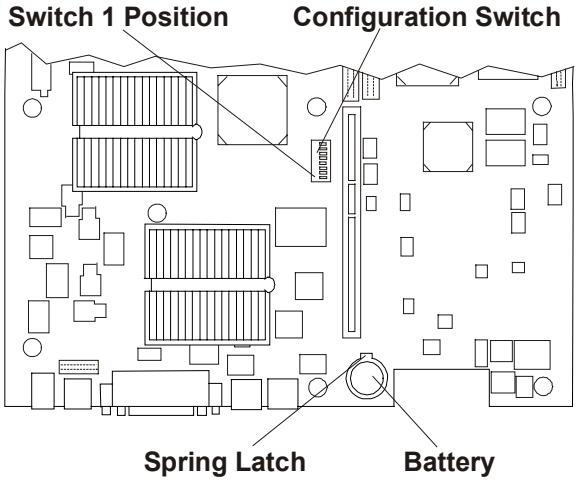
You may need to clear the CMOS configuration if the configuration has been corrupted, or if incorrect settings made in the **Setup Utility** have caused error messages to be unreadable.

To clear the configuration:

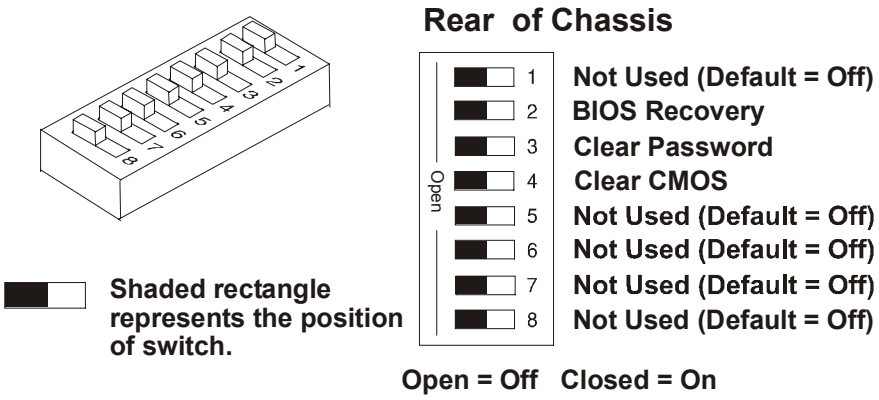
1. Turn off power to the Netserver and remove the cover.
2. Move switch 4 in the configuration switch on the system board (labeled "Clear CMOS") to the ON position.
3. Turn on power to the Netserver.

   A message displays indicating the configuration has been cleared.
4. Turn off power to the Netserver.
5. Return switch 4 on the system board to the OFF position.
6. Replace the cover.
7. Turn on power to the Netserver and the following message displays:

   ```
   Incorrect System Configuration
   ```
8. Press **[F2]** to run the **Setup Utility** when `<F2=Setup>` appears.
9. Make any configuration changes required.
10. Choose the Exit option and save the changes to save the configuration and exit the **Setup Utility**.



Configuration Switch Location



Configuration Switch Positions

Resetting a Lost Password

If you have forgotten the Power-on password, you can reset it using the configuration switch on the system board.

NOTE	If you have forgotten the Power-on password, your Netserver will function normally, but you will not be able to access the configuration settings in the Setup Utility or complete the boot process if you reboot the Netserver.

1. Turn off power to the HP Netserver.
2. Remove the cover.
3. Move switch 3 in the configuration switch on the system board (labeled "Clear Password") to the ON position.
4. Turn on power to the Netserver and allow it to complete its startup routine.

   The old password will be erased.
5. Turn off power to the Netserver.
6. Return switch 3 on the system board to the OFF position.
7. Replace the Netserver cover.
8. Turn on power to the Netserver and allow it to begin its startup routine.
9. If you wish to set a password again, press **[F2]** to start the **Setup Utility**.
10. Set the new password.
11. Choose the Exit option and save the changes to save the new password.

Hardware Problems

This section describes what to do if you have problems with your monitor, mass storage devices, printer, accessory boards, keyboard, or mouse.

Monitor Does Not Work

NOTE	If the Netserver has a large amount of memory installed, it may take 30 seconds for the first screen to display.

1. If nothing is displayed on the screen, but the Netserver starts and you have verified the keyboard, disk drives, and other peripheral devices are functioning properly:

   ◊ Verify the monitor is plugged in and power is turned on.

   ◊ Verify the brightness and contrast controls of the monitor are properly set.

   ◊ Verify the monitor video cable is securely connected to the Netserver.

   ◊ Turn off the monitor and Netserver and unplug each one from the power outlet.

   ◊ Disconnect the video cable from the Netserver and examine the video cable connector pins to see if any are bent.

   If any of the pins are bent, carefully straighten each one.

- ◊ If you have manually configured any accessories, verify each one does not use the same I/O address as the integrated video interface (03B0h to 03DFh).

  Refer to the documentation supplied with the accessory for more information.

2. If the display image does not align with the screen (usually after you have changed resolutions), use the display's controls to center the image.

   Refer to the monitor manual for information about the controls.

3. If the screens generated by the NOS do not look right, check the operating system manual to find out which video standard is required.

   Also check your monitor manual to find out which refresh rate is required.

4. If the screen goes blank after the NOS has booted, contact your HP support organization.

Keyboard or Mouse Does Not Work

1. Verify the keyboard and mouse are connected to the correct connectors.

   Refer to the I/O panel label on the rear panel of the Netserver.

2. Verify the mouse is correctly defined in the control options of your NOS.
3. Clean the mouse ball and rollers using a lint-free cloth.

CD-ROM Drive Does Not Work

1. Verify a CD is inserted in the drive.
2. Verify the power and data cables are correctly connected to the device.
3. Verify the CD-ROM is configured correctly in the menu located under the Security menu in the **Setup Utility**.
4. If you intend to boot from the CD, ensure the option is enabled in the **Setup Utility**.
5. For further information, refer to your CD-ROM documentation.

SCSI Device Does Not Work

If error messages display on the monitor indicating a failure of a SCSI hard disk or tape backup device, perform these checks:

1. Verify the power cable is securely connected to the drive, and the flat cable is securely connected to the drive and to the SCSI connector on the system board.
2. Verify all SCSI devices have unique IDs.
3. Ensure your SCSI device is not terminated.
4. Ensure connector pins are not displaced or distorted.

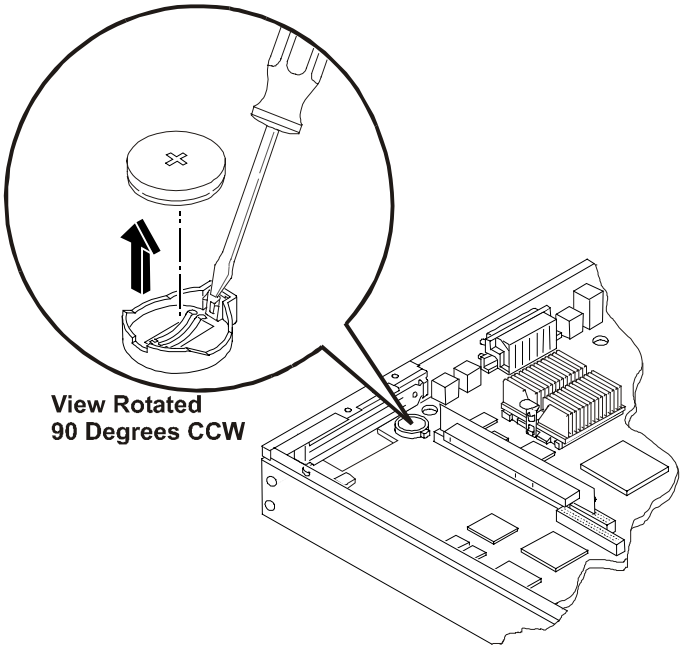
Replacing a Battery

If your HP Netserver repeatedly loses its configuration or the processor clock stops, you should replace the battery.

WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

1. Power down the HP Netserver and unplug power cord.
2. Remove the Netserver cover and the cooling duct/cover.
3. If the chassis is out of the rack, lay it on a flat surface with the system board components facing up.
4. If necessary remove the PCI board, which may prevent access to the battery.
5. Insert a small flatblade screwdriver or similar tool between the battery and spring latch.
6. Push the spring latch away from battery to release the battery.

   The spring contacts beneath the battery cause it to pop up allowing you to grasp the battery.
7. Remove the existing battery.



Battery on System Board

8. Insert the new battery with the positive sign (+) facing up in the socket.
9. Press down on the center of the battery with your thumb, pushing the battery down into the socket.

   The battery should snap into place.
10. Ensure the spring latch holds the battery firmly.
11. Replace the cooling duct/cover and the Netserver cover.
12. Power on the Netserver and reset the CMOS settings.

Problems Running the Setup Utility

If you cannot run the **Setup Utility**, the HP Netserver's configuration in CMOS memory may have become corrupt. The only way to recover from a corrupted configuration is to clear it. Refer to "Clearing the CMOS Configuration," earlier in this chapter.

5 Troubleshooting

Preventive Maintenance Procedures

Refer to this table for preventive maintenance procedures for this Netserver. Be sure to turn off power to the Netserver when cleaning it.

Preventative Maintenance Procedures

Component	Time Frame	Maintenance Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use "HP Video Screen Cleaning Solution" found in 92193M Master Clean Kit.
Mouse	Regularly	Refer to the mouse's manual for mouse maintenance procedures.
Tape drive heads	Monthly	Use "Magnetic Head Cleaning Solution" found in the 92193M Master Clean Kit.
Cooling fans and grilles	6 Months	Check functions of cooling fans and clean the intake openings on the chassis of dust, lint, and other obstructions to airflow.

CAUTION	Do NOT use petroleum-based cleaners (such as lighter fluid) or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage the keyboard's plastic surfaces.

HP recommends the periodic cleaning of tape heads, capstans, and guides on HP drive units and those products using high-density data cartridges and mini-data cartridges. This maintenance procedure prolongs tape and head life and helps reduce read/write errors due to dust and oxide

Troubleshooting Tips

WARNING	Before removing the top cover, always disconnect the power cord and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

- For problems with the HP NetRAID controller, refer to the appropriate HP NetRAID manuals.
- For problems with HP TopTools, refer to the *HP TopTools Administrator Guide* on the HP Web Site at

  `http://www.hp.com/toptools`
- For general information on management products, refer to

  `http://www.hp.com/go/netserver_mgmt`

  and search for "management."

Troubleshooting Checklist

To troubleshoot an installation problem, do the following:

- First, ensure the Netserver is configured properly.

  Most Netserver problems are the result of incorrect BIOS and SCSI configurations.
- If it is a network-related error, determine if the Netserver has enough memory and hard disk drive capacity.

  Consult your network operating system manual and its requirements.
- Verify all cables and boards are securely plugged into the appropriate connectors or slots.
- Remove all options added since the Netserver was received and then add one option, and only one option, at a time.

NOTE	If the Netserver has a large amount of memory installed, it may take 30 seconds for the first screen to display.

If it is a hardware error, follow these steps:

1. Log users off the LAN and power down the Netserver.
2. Remove the Netserver's cover.

WARNING	Before removing the cover, always unplug telephone cables and disconnect the power cord. Unplug telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

3. Simplify the HP Netserver configuration to the minimum required:

   A monitor, one flexible disk drive, one CD-ROM drive, one hard disk drive, keyboard, mouse, and NIC. Remove all third-party options, and reinstall one at a time, checking the Netserver after each installation.
4. Boot the Netserver.
   - ◊ If the Netserver does not function, consult the troubleshooting steps in the section "Hardware Problems."
   - ◊ If you get an error message, see the section "Error Messages" below.
5. If the Netserver still will not boot, clear the CMOS memory and reboot. See "Clearing the CMOS Configuration".

If the Netserver Does Not Power On

Follow these steps if the power/activity light does not light green after you press the power-on button:

1. Remove the AC power cord, wait 15 seconds, reconnect the power cord, and try again.
2. Verify all cables and power cords are firmly plugged into the respective receptacles.

3. If the Netserver is plugged into a switched multiple-outlet box, ensure the switch on the outlet box is turned on.
4. Plug a different electrical device (such as a printer) into the power outlet, and turn on the device to verify the outlet has power.
5. Verify the power supply is firmly connected to the system board connector.
6. Verify the front panel power switch is connected to the system board.

If the Netserver Powers On, but Fails POST

Do one of the following:

- If the Netserver fails POST and an error message appears, refer to the section "Error Messages." If the suggested solutions do not solve the problem, contact HP or your reseller.

If the Netserver Passes POST, but Does Not Function

If an error message appears, read the error message text for actions to take. If the actions do not solve the problem, contact HP or your reseller.

If there is no error message, follow these steps:

1. Verify the Netserver is configured correctly in the **Setup Utility**.
2. If the Netserver still does not work, turn it off and remove all external peripherals, except the monitor and keyboard. Test to see if the Netserver now works.
3. If the Netserver still does not work, turn off the monitor, the server, and all external devices, and check the internal hardware, as follows:
   a. Unplug the power cord and all telephone cables. Remove the Netserver cover.
   b. Verify all accessory boards are firmly seated in their slots.
   c. Ensure all disk drive power and data cables are securely and properly connected. Verify the mass storage configuration with the cabling diagrams shown on the Technical Reference Card, located in a plastic pouch on the interior of the Netserver cover.
   d. Verify the DIMMs are firmly seated on the System Board. Verify all added DIMMs are HP DIMMs.
   e. Replace the Netserver cover, and lock the Netserver.
   f. Replace all power cord and cables.
   g. Turn on the monitor.
   h. Turn on the server.
   i. Check for error messages.
4. Copy DiagTools from the *HP Netserver Navigator CD-ROM* to diskette, and run it from diskette.

BIOS Recovery

If the BIOS becomes corrupted, it is possible to perform a BIOS recovery to correct the condition. To recover the BIOS it is necessary to:

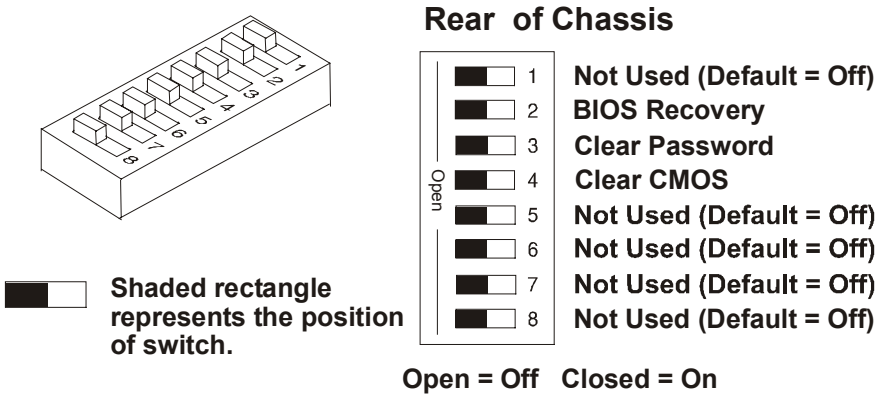
1. Create a BIOS Update diskette from the HP Netserver Navigator CD-ROM.

2. Power down the Netserver, gain access to the system board assembly, and set the BIOS Recovery switch of the configuration switch to the ON position.
3. Replace the cover and power on the Netserver with the BIOS Update diskette in the flexible disk drive.
4. The flash RAM program on the BIOS Update diskette will restore the BIOS to the Netserver.
5. Power down the Netserver, gain access to the system board assembly, and set the BIOS Recovery switch of the configuration switch to the OFF position.
6. Replace the cover and power on the Netserver in the normal manner.

A BIOS Update diskette must be created from the HP Netserver Navigator CD-ROM to be used in flashing the new BIOS into the Netserver. To update the BIOS, you enable the BIOS Recovery by setting the BIOS Recovery switch (switch 2) of the configuration switch on the system board assembly to the ON (enabled) position.

To perform a BIOS recovery:

1. Power down the HP Netserver and gain access to the system board assembly.
2. On the system board set the BIOS Recovery switch (Switch 2) of the configuration switch from OFF to ON.



System Board Configuration Switch

3. Replace the cover.
4. Place the previously created BIOS Update diskette into the flexible disk drive of the Netserver and power up the HP Netserver.
5. The flash program on the diskette will re-program the BIOS providing recovery from the BIOS corruption.
6. When the flash programming is completed (indicated by a long beep), power down the HP Netserver.
7. Gain access to the system board assembly and set the BIOS Recovery switch (Switch 2) from ON to OFF
8. Replace the cover.
9. Power on the Netserver in the normal manner.

Password Problems

This section describes some common password problems.

Resetting Lost Passwords

If you have forgotten the User or Administrator password, you can reset each one. The User password can be reset if you know the Administrator password, but the Administrator password can only be reset by a switch on the system board.

User Password

If you have forgotten the User password, but the Administrator password is known, perform the following steps:

1. Restart the Netserver.
2. During the boot process, press **[F2]** to start the Setup program.
3. Enter the Administrator password and then access the Security menu of the **Setup Utility**.
4. Scroll to the "User Password is" field and press **Enter**.
5. Enter the Administrator password as the old password and press **Enter**.

   This will replace the old, forgotten password.
6. Enter the new password in the "Enter new password: [ ]" field and press **Enter**.

NOTE	Entering nothing or "blank" in the "Enter new password" field followed by entering nothing or "blank" in the "Re-enter new password" field will turn off the password setting, changing it to "Not Set."

7. Enter the new password again in the "Re-enter new password: [ ]" field and press **Enter**.
8. Press **Esc** and scroll to the Exit menu and save the changes to save the new password.

Administrator Password

You can only reset a forgotten Administrator password by using the configuration switch on the system board. If you have forgotten the Administrator password, your Netserver will function normally, but you will not be able to access the **Setup Utility** or complete the boot process, if you reboot the Netserver. To reset the Administrator password, refer to the following procedure.

1. Turn off power to the HP Netserver.
2. Remove the cover.
3. Move switch 3 in the configuration switch on the system board (labeled "Clear Password") to the ON position.
4. Turn on power to the Netserver and allow it to complete its startup routine.

   The old password will be erased.
5. Turn off power to the Netserver.
6. Return switch 3 in the configuration switch on the system board to the OFF position.

7. Replace the Netserver cover.
8. Turn on power to the Netserver and allow it to begin its startup routine.
9. If you wish to set a password again, press **[F2]** to start the **Setup Utility**.
10. Set the new Administrator password.
11. Choose the Exit option and save the changes to save the new password.

General Netserver Problems

No lights are on and no error message appears

If the Netserver does not work (no lights are on, including backlighting on models with LCDs) and no error message appears, check the following:

1. Verify that power is good and available
2. Make sure that the Netserver is turned on (the power-on light should be green and the fans should be on).
3. Turn the Netserver off and unplug the power cords. Wait 30 seconds and plug the power cords in and turn the Netserver on. Verify the failure.
4. Verify all boards are installed properly and seated firmly in the slots with cables firmly connected.
5. If the Netserver stopped working after you installed a new accessory, remove the accessory and turn on the server. If the Netserver now works, go to step 8.
6. If the Netserver still does not work, remove all accessory that you have installed (do not remove the flexible or hard disk drives) and turn on the server.
7. If the Netserver now works, turn off the Netserver; add one accessory at a time to determine which one is causing the problem. Turn on the Netserver after installing each board or option. When the problem returns, the last board or option installed is defective.
8. If you have added any memory, make sure that the modules are seated properly on the processor board.

The application or operating system is not responding properly

1. In Netserver models with accessible cache feature, determine if the memory cache feature is turned on or off.

   Memory cache may need to be turned off for some older software. It may also need to be turned off for those accessory boards that have on-board firmware, and for those boards that use memory-mapped I/O.
2. If necessary, turn off the memory cache feature. Check the state of memory cache and, if necessary, disable it:
   a. Push **[F2]** during the boot process
   b. Go to configuration and turn off Memory Caching

The Netserver stops working (hangs)

Typically, if the Netserver hangs before the end of the **POST** completes, the problem is probably a hardware failure. If the Netserver hangs after the **POST** completes, the problem is probably due to an incorrectly configured or corrupt driver, operating system, or application program, or a media (disk drive) error.

If the Netserver stops working, try the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Turn the Netserver off and unplug the power cords. Wait 30 seconds and plug the power cords in and turn it on. Verify the failure.
3. If the problem persists, replace the system board.
4. Once a problem has been found with a part, verify that it is the problem (or the only problem) by reinstalling the part and replicating the error.

The Netserver does not start (boot)

Locate the memory modules (SIMMs/DIMMs).

NOTE	The POST error messages reflect which modules are defective and should be replaced.

1. Review the **Troubleshooting Checklist** before you continue.
2. Power the Netserver off and on (rather than using **Ctrl+Alt+Del**) as it is a more complete system reset.
3. On Netservers with diagnostic LEDs near the DIMM sockets, note any blink codes.
4. If the POST reports a problem, check the error against the Error Messages and correct the problem.
5. Verify the video subsystem is configured correctly.
6. Verify the memory DIMMs are all of the same (specified) speed.
7. Verify the memory DIMMs are installed and configured correctly:
   a. Make sure only HP-supported DIMMs are used.
   b. Remove the system board, install a known good memory module, and reboot. If you still receive an error, replace the system board.

   If the error goes away, add another module and reboot again. Continue this process until you have installed all memory modules or you experience a failure. Replace the defective module(s).
8. Remove one accessory board at a time and reboot the Netserver. Verify the problem.
9. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Power Problems

Symptoms:

- A fan is not working
- The power LED does not light

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify the AC power source is good:
   a. If the Netserver fans are audible or a control panel light is on, the power is on.

b. Verify the circuit breaker for the AC power outlet.

c. If the breaker was off, check that all devices connected the Netserver share the same circuit breaker and are the only devices on it. Reset the circuit breaker after reconfiguring the devices, if need be.

d. Verify the AC power outlet is not faulty. Test it by plugging in a known-good device.

e. Verify the third-wire ground is isolated from other grounds and is at ground potential.

3. Verify all cable connections:

   ◊ AC power cords from AC source outlet to server

   ◊ DC Power supply cables to all Netserver PCBs

   ◊ DC power supply cables to disk drives and/or mass storage cages

4. If the fans aren't audible and the above steps are verified, check that power is getting to all fans. HP Netservers have multiple fans. All fans run when power is turned on; all are off when the power is off.

   With the power supply connected to the system board, check the power supply's voltages.

5. If voltages are not present:

   a. Turn off AC power.

   b. Disconnect the power cords for 5 minutes in order to reset the power supply's circuitry.

   Turn on AC power again. If power is still not getting to the system board, replace the power supply (or power supply module on some Netserver models).

6. If power is getting to the fan but the fan isn't working, replace the fan (or replace the power supply in Netserver models with fans incorporated in the power supply).

7. If the problem continues, replace the power supply module.

8. If, after replacing the power supply, the problem persists:

   a. Remove all accessory boards, including any hard disk drive controller board or the video board the customer might have installed, and reboot the Netserver.

   b. Disconnect all mass storage power cords and cables (except those to the boot device) and reboot the Netserver.

9. If the problem goes away, reinstall the original suspected part to verify that it is causing the problem.

Video/Monitor Problems

Symptoms:

- Nothing is displayed on the monitor.
- The monitor is blank.
- The wrong size characters appear on the monitor.
- Colors are wrong or there are no colors on the monitor.

If you installed a video board and are not using the built-in video system, go to Step 12.

If you have two video monitors connected, test the monitors to make sure they are working (Step 1-4) then go to Step 10.

1. Review the **Troubleshooting Checklist** before you continue.
2. Check the contrast and brightness controls to ensure each is adjusted.
3. Verify the video and power cords are connected to the monitor.
4. Ensure there is adequate power:
   a. Verify the display power switch is turned on.
   b. Verify the display power cord is connected to an AC power outlet and the video cable connected to the server's video connector.
   c. Plug in a known working device to ensure there is power to the outlet or use the proper testing device to check the power outlet.
   d. Turn the monitor off and on, and if the monitor has an on/off LED, see if it lights.
   e. Turn the Clear Configuration switch on the system board to OFF and reboot the Netserver. Check if the problem persists.
5. Turn on the Netserver and wait a full 2 minutes. Verify the monitor starts displaying normally.
6. If the problem persists, and if the power cord is detachable, try a known good power cord.
7. Unplug the power cord and wait 30 seconds. Plug in the power cord and turn on the Netserver. Wait a full 2 minutes. Check that the monitor starts displaying normally.
8. Check the monitor display to see if the system memory count takes place correctly.
   a. Turn the Netserver off and then on. Check to see if the memory is counted during the Netserver boot. If no count occurs, go to Step 10.
   b. Check to see if the count occurs in the color appropriate for the monitor.

   If the count occurs in the wrong color, the problem may be with the video subsystem, the monitor, or the monitor cable. (Continue with the troubleshooting steps.)
9. If you are using a video screen saver utility and the screen goes blank while using the keyboard, you may be using an application that turns off the screen even when you are using the keyboard. Refer to the manual that came with the screen saver utility.
10. Ensure the memory modules (DIMMs) are correctly seated in their slots. You may want to remove and reinstall each memory module to ensure it does not cause the problem. Verify the correct type, size, and combinations of modules for this model Netserver are installed.
11. To see if the display is functioning:
    a. Turn off the monitor and the server.
    b. Disconnect the video cable from the video connector.
    c. Turn on the monitor.

    Monitor Notes:

    - When most EGA and VGA monitors are disconnected from the video connector, if the monitor is working, the screen is white.
    - When some monitors (such as HP high-resolution monitors) are disconnected from the video connector, the monitor may be working, although the screen is black.
    - If the display is black or white when it should be in color, check the monitor cable to see if a pin is bent. If a pin is bent, slowly but carefully straighten the pin. Replace the cable if the pin cannot be straightened successfully.

- ◊ If a monitor tester is available, use it to check the display.
- ◊ If you suspect the monitor is faulty, replace it with a known good monitor. Then reinstall the original monitor and duplicate the error.

12. Verify the monitor is working by plugging it into a know-good Netserver or computer.
13. Check to see if the monitor connector's pins are bent. If the pins are bent, slowly but carefully straighten each pin.
14. Connect the monitor cable to the Netserver video connector and turn on the Netserver. If there is a display, but characters are the wrong size or the display is the wrong color:
    a. Check whether the monitor is a color or monochrome monitor.
    b. Verify the video cable is properly inserted in the connector on the back of the computer.
    c. Check for bent pins on the connectors.
15. If the customer has installed a video board instead of using the built-in video, make sure all jumpers and switches are set properly on the installed video board. (See the manual for the video board.)
16. If the monitor displays a badly scrambled image that looks to be the current screen image, then the monitor is not synchronizing correctly.
    - ◊ If a video board is installed, replace it with a known good one. The video timing setting on the board may be bad.
    - ◊ If it is the on-board video, replace the system board.
17. If a video board is installed and the built-in video is used:
    a. Make sure the video board/built-in video combination is supported. Usually, two video systems (for example, internal video and a video adapter board) cannot be used at the same time.
    b. If there is still a problem, make sure the board is seated correctly.
    c. If there is still a problem, remove the video adapter board, and enable the internal video system. Verify the problem.
18. If a message appears such as "INVALID CONFIGURATION", run the **Setup Utility** and press **[F2]** during the boot process or boot the HP Navigator CD-ROM) to confirm the Netserver video configuration. Make sure other accessory boards do not use the same memory addresses as the HP video system.
19. If the problem is isolated to the built-in video system, replace the system board.
20. Once a suspect part has been found, verify it is the problem by reinstalling the part and duplicating the error.

Configuration Problems

Symptom:

- An installed driver cannot find a PCI board

Installing a PCI board which bridges the two system PCI buses (certain adapter boards provide this feature) can cause previously installed PCI drivers to not recognize their adapter board(s).

To resolve the configuration problem, move the PCI board that has bridging capability to a primary PCI slot.

Symptom:

- The configuration cannot be saved and the battery loses power

Refer to this section if the Netserver frequently loses date and time that may be caused by the battery losing power.

1. Review the **Troubleshooting Checklist** before you continue.
2. If the Netserver frequently loses the time and date, replace the battery. The battery is attached to the system board.
3. Set the new date and time, and reset the configuration parameters using the **Setup Utility**, if necessary.
4. Turn off AC power to the Netserver, then reboot to see if the date and time was saved.
5. If date and time are still requested, and the battery is good, perform the next procedure, below.

If your HP Netserver repeatedly loses its configuration or the clock stops, you should replace the battery or install an external battery.

WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Symptom:

- The configuration information is frequently lost and the battery is good

If the battery is good and you cannot save system configuration, do the following

1. Review the **Troubleshooting Checklist** before you continue.
2. Configuration information is saved in the CMOS. If you continue to loose configuration information and the battery is good, or you cannot save the information to the CMOS:
   a. If possible use the configuration utility to save the current configuration to a diskette.
   b. Replace the system board.

Printer/Datacomm Problems

Symptom:

- A printer does not print or datacomm devices are not working

If the printer does not work, or the datacomm devices are not working, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify correct cables have been used, the cables are connected properly, and the cable pins are not bent.

   Check the cable for continuity, or try a known good cable. Refer to the peripheral's manual.
3. Verify the AC power cord is plugged into the power source and the printer.

4. Ensure the printer power switch is on.
5. Ensure the AC outlet is working. If the printer is plugged into a multiple-outlet box, make sure the switch on the outlet box is turned on, and the circuit breaker (if equipped) is not tripped.
6. Ensure the printer is on-line.
7. Examine the printer for a paper jam.
8. Run the printer internal self-test (if it has one) to make sure that the printer is functional. Refer to the printer's manual for instructions.
9. Ensure you have selected the correct port setting when you configured the printer. The printer must be configured correctly for the Netserver and for the application. You may need to change some switch settings on the printer.
10. Ensure you have not disabled the I/O ports. Run the **Setup Utility** (press **[F2]** during the boot process) and verify the I/O port status.
11. Ensure the server's printer port is working properly by running another peripheral from that port.
12. If the printer still does not work, it may have a resource conflict with another board or accessory. Remove boards and accessories (except the hard disk drive) one at a time to isolate the conflict. Check the printer for proper operation after you remove each board or accessory.
13. If an error message appears on the screen, refer to **Error Messages** and the printer's manual for help.
14. If the Netserver was working before you installed the accessory, remove the accessory and restart the Netserver.
15. If the problem persists, replace the system board.

Keyboard and Mouse Problems

Symptoms:

- The keyboard does not work
- A character is not displayed when a key is pressed

1. Review the **Troubleshooting Checklist** before you continue.
2. Ensure the keyboard is not locked.
3. Ensure the keyboard cable connections at the rear of the Netserver and at the back of the keyboard are securely and correctly attached.
4. If a keyboard/monitor switchbox is used with this Netserver, plug the keyboard directly into the keyboard port of the Netserver. Verify the problem.
5. If the problem persists, turn off the Netserver and back on by using the power button.
6. Try replacing the keyboard with a known good keyboard.
7. If the problem persists, check the keyboard cable for continuity, or try a known good cable.
8. If the problem persists, replace the system board.
9. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Symptom:

- The mouse does not work or is intermittent

The HP Netserver automatically detects a mouse when one is installed. If the mouse or other input device is not working, perform the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Check that the mouse cable is properly and securely connected to the server.
3. If a keyboard/monitor switchbox is used with this Netserver, plug the mouse directly into the keyboard port of the Netserver. Verify the problem.
4. Ensure mouse's port does not have a resource conflict. Use the **Setup Utility** (press **[F2]**.
5. Ensure correct mouse driver has been installed onto the boot drive. Refer to the mouse installation manual or the operating system manual.
6. Replace the mouse with a known-good unit.
7. If the problem persists, replace the system board.
8. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Flexible Disk Drive Problems

Symptoms:

- There are lost clusters
- There are read/write errors
- The Netserver will not start from a diskette

If you cannot boot from, write to, or format the flexible disk, do the following:

1. Review the **Troubleshooting Checklist** and read about **Boot Device Priority** before you continue.
2. Try booting from a good known flexible disk.
3. Check to see if boot from CD-ROM is enabled and if there is a bootable CD in the CD-ROM drive.
4. Select the **Setup Utility** (press **[F2]** during the boot process and check that the Netserver's mass storage configuration is correct. If for some reason you cannot run the Setup, you can clear CMOS and reconfigure the server.

   Try to reboot.
5. If you cannot format or write to a flexible disk:

   ◊ Ensure diskette is not write protected.

   ◊ Ensure disk drive is properly configured with the **Setup Utility**. Make sure that "Start from Flexible Disk" option is disabled.
6. Verfiy all internal drive cables are securely attached and functional. Inspect the cables and reseat the connectors at both ends.

7. If the cables are securely attached, and the drive still does not work, replace the cables with known good cables, one at a time.
8. If the problem persists, and/or there is an error code, replace the faulty part (the drive, the system board, etc.)
9. If the problem persists, check for environmental problems that can damage disk media and disk drive heads.

   Environmental problems result from:

   - Radiated Interference: Sources include communications and radar installations (such as at an airport), radio/TV broadcast transmitters, and hand-held receivers.
   - Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

CD-ROM Problems

Symptom:

- The CD-ROM drawer will not open

If the CD-ROM drawer fails to open when you press the Eject Button or with software commands, do the following:

1. Turn off all power to the computer.
2. To open the drawer, insert a pointed object, such as a paper clip, into the emergency eject hole and push in about 1.75 inches (40 mm).
3. Remove the disk and close the drawer.
4. After you remove the disk, start the computer and try to open the drawer again with the Eject Button or software commands.
5. If the drawer still will not open, replace the CD-ROM drive with a working unit.

Symptom:

- The CD-ROM drive is not working properly

The CD-ROM drive that comes with certain HP Netserver models is a SCSI device; others are IDE devices. If the CD-ROM drive does not work, do the following:

1. Review the basic SCSI installation guidelines to ensure a proper configuration.
2. In addition, check the following:

   - Verify correct drivers are installed.
   - Verify a CD-ROM disk in the CD-ROM drive.
   - Verify all internal drive cables are securely attached and functional.
3. If the drive is a Hewlett-Packard CD-ROM drive, review the *CD-ROM Installation Guide* for any special installation instructions.
4. Try installing a known good CD-ROM drive
5. If the problem persists, check for environmental problems that can damage disk media and disk drive heads. Environmental problems result from:

- ◊ Radiated Interference: Sources include communications and radar installations, radio/TV broadcast transmitters, and hand-held receivers.
- ◊ Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

Symptom:

- The Netserver won't boot from the CD-ROM

Use the **Setup Utility** to make sure the CD-ROM drive is bootable:

1. Review the **Troubleshooting Checklist** and **Boot Device Priority**
2. Run the **Setup Utility**.
3. Enable support for bootable CD-ROM.
4. Save and exit the utility.

SCSI Problems

Symptom:

- The external SCSI subsystem does not work after installation

If the external SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and read **Mass Storage Guidelines**.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. Refer to the documentation that came with the SCSI devices for any specific information on installing them.
4. Ensure all installed SCSI controllers are installed and configured correctly.
5. For any SCSI devices installed in an enclosure external to the Netserver chassis, make sure that Ultra SCSI is disabled on this controller. SCSI devices external to the Netserver chassis are supported in Fast SCSI mode only.
6. Check the SCSI cables for problems that may have been caused by recent computer maintenance, hardware upgrades, or physical damage.
7. Check the ROM BIOS version to make sure it is the most recently issued version. Booting the most recent version of the *HP Netserver Navigator CD-ROM* will automatically report if the BIOS is not current and needs updating (“flashing”). Follow the instructions in the screen to update the BIOS.
8. Check that the external SCSI subsystem BIOS is being executed properly.

   - ◊ When you start the server, the incrementing count of the RAM appears on the screen. Then the external SCSI BIOS displays a banner and a copyright notice.
   - ◊ The BIOS then checks for valid devices on the SCSI bus, and reports which devices are found. If you have installed and configured the SCSI devices correctly, you will see a list confirming all SCSI devices installed in the Netserver.
   - ◊ If the banner is not displayed, the external SCSI controller is not recognized.

9. Verify the SCSI bus is terminated at both ends. By default, HP SCSI controllers are terminated. When a device is connected to a connector on the controller, bus termination for that connector is disabled. Verify that the last device on the bus is terminated.
10. Ensure no device is set to SCSI ID7; this is the SCSI ID used by the SCSI controller.
11. Verify all SCSI devices are either single-ended or differential SCSI devices (depending on the Netserver model), and that any bus does not contain both types.
12. Verify the SCSI hard disk drive that loads the operating system is set to the lowest SCSI address (usually set to 0).
13. If a second hard disk drive is connected to the SCSI cable, check it for proper SCSI address, SCSI cable connection, proper power, and jumper settings.
14. Disconnect all SCSI devices except the integrated SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter board and a good hard disk drive.

Symptom:

- The SCSI BIOS has trouble loading

If the Netserver has trouble loading the SCSI BIOS, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. If you installed more than one SCSI controller, make sure that the BIOS of all SCSI controllers are disabled except for the boot controller. This lets the SCSI BIOS for the boot controller load.
3. Determine what the boot device priority is for the Netserver model. Verify that the boot device is in the right place in the priority.

Symptom:

- The SCSI subsystem does not work at installation

An incorrect configuration and not faulty hardware cause many SCSI problems. If the SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and **Mass Storage Guidelines** before you continue.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. If you don't see the SCSI BIOS banner during Netserver start:

   ```
   "Symbios, Inc. SDMS(TM)V4.0 PCI SCSI BIOS, PCI Rev. 2.0, 2.1"
   "Copyright 1995, 1998 Symbios, Inc."
   ```

   - Check the cable connections.
   - Check the SCSI termination.

4. Run the **Setup Utility** or SCSI Configuration Utility and verify the SCSI host bus adapter (HBA) is properly configured.

   The HBA is usually SCSI ID 7.

5. If you installed more than one SCSI adapter, verify each adapter is set to a separate BIOS address; or disable the BIOS on all of the adapters except one.

6. For each device, verify;
   - ◊ The device has a unique SCSI address.
   - ◊ In general, when selecting an address for a drive (default address is 0), select as low a SCSI address as possible.
   - ◊ The device's jumpers are set according to the device documentation.
   - ◊ The hard disk activity light cable (for non-hot-swap devices) is properly installed.
7. Check that the primary SCSI hard disk drive is set to the lowest address (usually set to 0). Each device (the HBA is also a device) must have a unique and separate SCSI ID number. To solve this problem, simply set the device ID to something other than that of the HBAs SCSI ID (7). If the device is a boot drive, then the SCSI ID should be set at 0.
8. If another hard disk drive is connected to the SCSI bus, check it for unique address, SCSI cable connection, and power connection.
9. Check the SCSI bus cable for correct orientation, alignment, and seating on the SCSI adapter and the SCSI device.
10. Check for the correct Hewlett-Packard internal and external SCSI cables.
11. Check that all SCSI devices are connected to power, and power-on all SCSI devices before or at the same time as the Netserver to ensure a stable SCSI bus.
12. Watch the boot screen for all SCSI devices to be displayed. For example, in a Netserver with 1 SCSI controller and 2 hard disk drives (one with ID 0 and one with ID 1), if a valid device is found at device address 0, but not at address 1, you would see these device validation lines on the boot screen:

    ```
    Channel x, SCSI ID #n - id info - Drive C: (80h)
    ```

    If you see this message:

    a. Verify that the SCSI hard disk drive is set to address 1.

    b. Check the SCSI bus cable for correct orientation, alignment, and seating on the host adapter and the hard disk drive.

    c. Verify that terminators are installed at each end of the SCSI bus, but not on any other devices. The hot swap cage printed circuit board has automatic termination that disconnects when a cable is attached.

    d. Verify all SCSI devices on the bus are appropriate for that bus (only single-ended SCSI devices on the single-ended bus; only differential SCSI devices on the differential bus).
13. If the Netserver still fails to recognize the SCSI drive, disconnect all SCSI devices except the host adapter and the drive at SCSI address 0 and try again. If the Netserver fails, try substituting a known good hard disk drive.
14. If the SCSI BIOS has properly identified device 0 and has installed it as drive C, but cannot find a device at address 1, and in addition, if no further messages are displayed, it indicates the Netserver cannot load the operating system from device 0, check the following:

    a. If a second hard disk drive is connected to the SCSI bus, check it for proper address selection, SCSI cable connection, and proper power.

    b. Partition the hard disk drive if required.
15. Use only SCSI devices without built-in terminators.

The HP Netserver embedded controllers are terminated automatically on the hot swap cage or at the end of the SCSI cable. If you are installing a SCSI device that uses a built-in terminator, you must remove the terminator from the device before proceeding with the installation.

Use only the HP Netserver SCSI cables for the SCSI hot swap subsystem.

16. Verify all SCSI devices on the bus are appropriate for that bus (only single-ended SCSI devices on the single-ended bus; only differential SCSI devices on the differential bus).
17. Disconnect all SCSI devices except the SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter and disk drive.
18. Use the **Setup Utility** to check for resource conflicts, especially if new boards or accessories have been added.

Symptom:

- The SCSI subsystem stops working

If the SCSI subsystem should stop working, do the following:

1. Review the **Troubleshooting Checklist** and **Mass Storage Guidelines** before you continue.
2. Run **DiagTools**. Verify that the SCSI ID and other switch settings are correct and get specific information or verification that the problem is the SCSI bus.
3. If an accessory board was added recently, check if there is a resource conflict between the new board and an existing accessory board. Also, if you have changed the options on an existing board, there may be a resource conflict.
   a. Remove the new board and restart the computer. If this corrects the problem, the board is either defective or it is trying to use a system resource used by the SCSI subsystem.
   b. Check if the board is using memory, I/O addresses, or interrupt lines that are also used by the SCSI subsystem.
4. Check to see if there have been recent changes to any software. For example, has anyone moved, removed, or changed the configuration files or drivers? Refer to the software documentation for more information.
5. If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure is probably the most unlikely reason for a SCSI subsystem failure.

Processor Problems

If a problem exists with the Netserver processor;

1. Remove and reseat the processor module(s).
2. Replace each of these components, one-at-a-time, with a known-good component, and retest the Netserver:
   - Processor
   - Terminator (if so equipped)

CAUTION	Do not push on the processor components; push only on the edge. Pushing on the device may damage it.

3. If the fault persists, replace the system board.

Memory Problems

The memory modules are DIMMs.

NOTE	If the **POST** (displayed at power-on time) indicates a defective memory module, replace it.

1. Review the **Troubleshooting Checklist** before you continue.
2. If memory problems are being experienced, power the Netserver off and on. This performs a "cold" restart, rather than a "warm" restart (as it does when you press **Ctrl+Alt+Del**).
3. Check the BIOS event log (available on certain Netserver models) for messages indicating memory errors.
4. Run the **DiagTools** memory test.
5. Reseat the memory modules.
6. To check that the modules are installed and configured correctly:
   a. Run the **Setup Utility** and check the configuration.
   b. Install one known good DIMM. If you still receive an error, replace the system board.

      If the error goes away, add another DIMM and reboot again. Continue this process until you have installed all DIMMs or you experience a failure.

      Replace the defective DIMM.
7. Once a suspect part has been found, verify the cause of the problem by reinstalling the part and attempting to duplicate the error. Also install it in another memory socket to confirm whether or not the socket is defective.

Network Interface Card Problems

See the appropriate Network Interface Card documentation.

Symptom:

- If the adapter can't connect to the network

1. Make sure the cabling is installed properly.
2. Most hub and switch connections require straight-through cable; consult their documentation. If you're directly connecting two computers (with no hub or other device), use a “crossover” cable.
3. Verify there are no resource conflicts between the NIC and any other accessories in the Netserver. Check the **Setup Utility**.
4. Check the LEDs on the adapter at the back of the computer to see if any show activity. No lit LEDs probably indicate a bad network cable, hub connection or other network error.
5. Ensure you're using the latest and correct drivers. Verify the drivers are intended for this adapter.
6. Ensure the port on the switch or hub (or other device) has the same duplex setting as the adapter.

7. If you configured the adapter for full duplex, make sure the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.
8. Test the adapter as directed in the installation tasks for each operating system. Also check the “README” files on the support disk.

6 Replacing Parts

Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the server:

- Use an anti-static wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155).
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

WARNING	Hazardous voltages are present inside the server. Always remove AC power from the CPU and other associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.

Tools and Supplies Needed

- Small flat-bladed screwdriver.
- Jumper-removal tool or needle-nosed pliers.
- Antistatic wrist strap and conductive foam pad (recommended).
- Pen or pencil.
- Equipment log: as you integrate new parts into the system, add information about them to your equipment log. Record the model and serial number of the system, all installed options, and any other pertinent information specific to the system.

Safety: Before You Remove Server Covers

Before removing covers at any time to work inside the system, observe these safety guidelines.

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by using the push-button on/off power switch on the front of the system.
3. Unplug the AC power cords from the system or wall outlet.
4. Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back of the system.
5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.

Warnings and Cautions

These warnings and cautions apply whenever you remove covers of the system. Only a technically qualified person should integrate, configure, or service the system.

WARNING	**System power on/off:** The on/off button (a convex button) on the front of the chassis DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlets or the system. **Hazardous conditions, power supply:** Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel. **Hazardous conditions, devices, and cables:** Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and disconnect the power cords, telecommunications systems, networks, and modems attached to the system before opening it. Otherwise, personal injury or equipment damage can result. **Hazardous conditions, processors and power pods:** Thermal conditions may be present in the processor/memory complex. Allow all fans to continue to run until they shut down on their own after power has been turned off. After the fans stop, the power cords can be removed.

CAUTION	**Electrostatic discharge (ESD) and ESD protection:** ESD can damage disk drives, boards, and other parts. We recommend that you do all procedures in this chapter only at an ESD-protected workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground—any unpainted metal surface—on your system when handling parts. **ESD and handling boards:** Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place it component-side UP on a grounded, static-free surface. If you place the I/O carrier on a conductive surface, the battery leads may short out. If they do, this will result in a loss of CMOS data and will drain the battery. Use a conductive foam pad if available but NOT the board wrapper. Do not slide board over any surface. **Cooling and airflow:** For proper cooling and airflow, always install the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts.

Removing and Installing the Top Cover

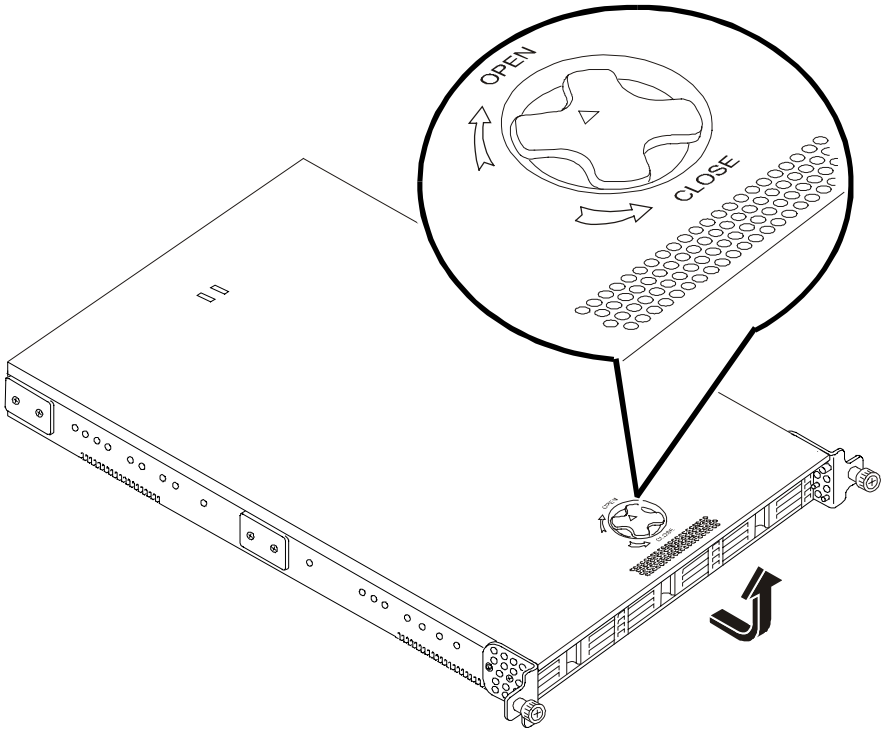
WARNING	Before removing the cover, always disconnect the power cord and unplug telephone cables. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist-strap contacts your skin.

Removing the Top Cover

To remove the top cover, follow these steps:

NOTE	You do not need to remove the front bezel to remove the top cover of the Netserver.

1. If the HP Netserver is operating, log off all users and shutdown the operating system.
2. Disconnect the power cord and any cables attached to the Netserver.
3. Remove the Netserver chassis from the rack and lay it on a flat surface.
4. Release the top cover by turning the knob at the front of the chassis to "Open" position (clockwise direction).
5. Slide the top cover about 1½ inch toward the front of the Netserver and then lift it off of the chassis.

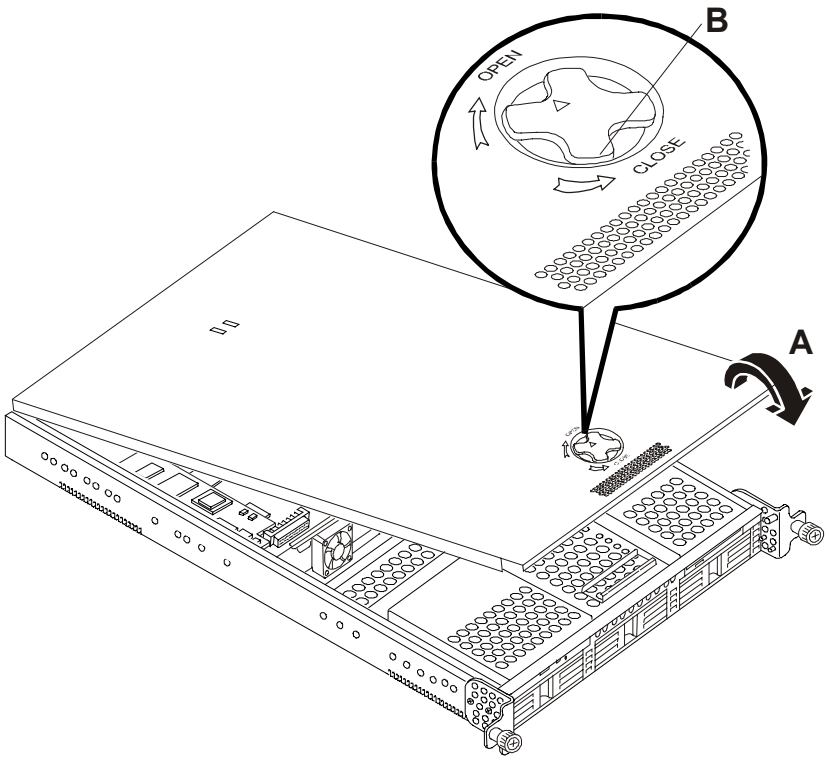


Removing the Top Cover

Replacing the Top Cover

To replace the top cover, follow these steps:

1. If the HP Netserver is already laying on a flat surface with no power applied, continue with Step 5.
2. If the HP Netserver was operating with the cover removed, power down the operating system and turn off the Netserver power switch.
3. Disconnect the power cord and any cables attached to the Netserver.
4. Remove the Netserver chassis from the rack and lay it on a flat surface.
5. Ensure the knob is turned to the "Open" position (clockwise position).
6. Place the rear edge of the top cover on the rear edge of the chassis and lay it down on the chassis.
7. Rotate the knob to the "Closed" position (counter clockwise position).



Replacing the Top Cover

8. Install the Netserver back into the rack and secure it to the rack.

NOTE	Some rack options do not require removing the HP Netserver from the rack to remove or replace the top cover.

Removing the Front Bezel

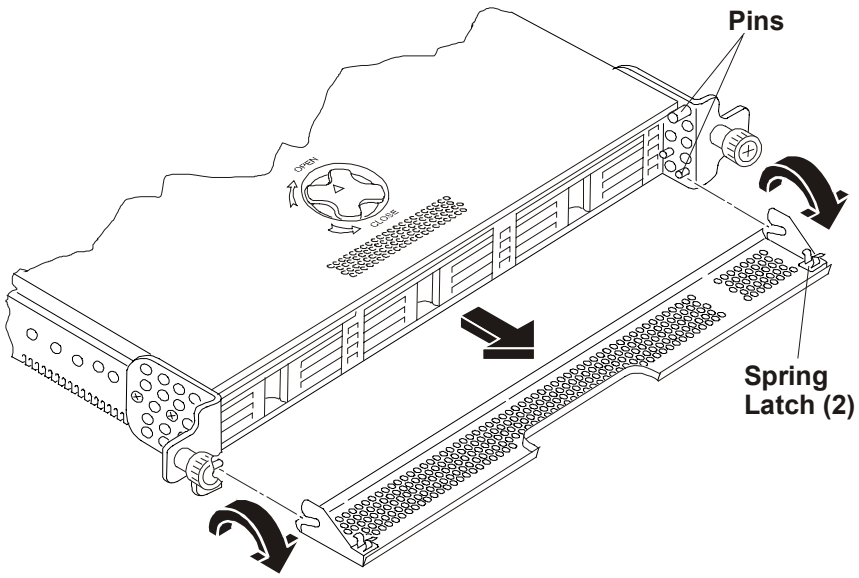
The front bezel is provided to protect the power and reset switches from accidental disabling.

To remove the front bezel, follow these steps:

NOTE	You do not need to removal the front bezel to remove the top cover of the Netserver. You do need to remove the front bezel to install mass storage devices or media.

1. If the Netserver is operating, you do not need to turn off power to remove the front bezel.
2. Release the front bezel by placing your hand at the center of the half-moon opening in center of the front bezel.
3. Pull out towards you on the front bezel.

   The bezel rotates down to approximately a 80° angle.
4. Pull and lift the bezel out toward you, and remove it from the chassis.



Front Bezel Location

NOTE	The front bezel pivots on two pins at the bottom, and is held in place at the top with spring latches holding onto the top pins. The middle pins limit bezel rotation to an 80° angle.

Replacing the Front Bezel

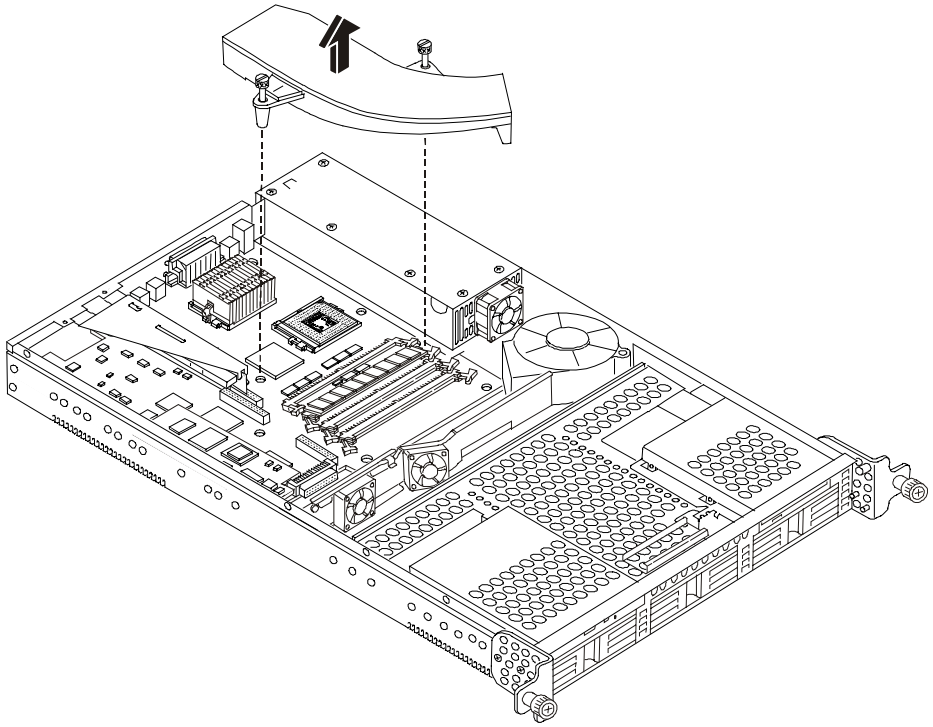
1. Place the bottom edge of the front bezel into the hinge pins at the bottom front of the chassis.
2. Rotate the top front of the bezel into place and push it in at the top, allowing it to snap into place.

   The spring latches grasp the pins at the top and hold the bezel in place.

Removing the Air Duct

The air duct directs air from the fan onto the heatsinks of both processors. The air duct also restricts access to both processors and all the DIMMs, and must be removed for full access.

1. Loosen the two captive screws holding the air duct to the system board.
2. Remove the air duct from the system board.



Removing the Air Duct

Replacing the Air Duct

To replace the air duct, simply reverse the steps in the previous procedure.

Removing Hot Swap Hard Drives

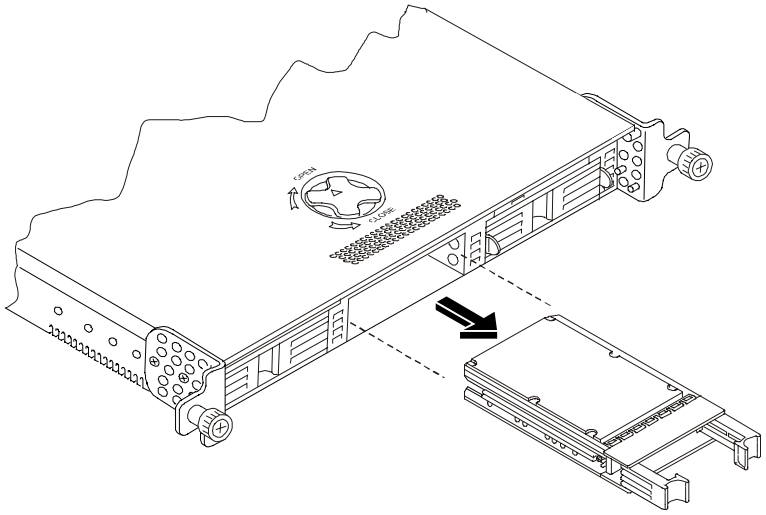
CAUTION	*You must remove the drive slowly and then wait for the drive heads to park before completely removing the drive.* Ensure you follow these instructions carefully to prevent handling damage, such as head slaps or head actuator unlocking.

1. To unlock the drive and remove it:
   a. Place both thumbs into the opening at the center of the drive.
   b. Pull out on both ejector arms with both thumbs at the same time.

      You should hear the each ejector arm click as you pull it outward.
   c. Pull both ejector arms toward you.
2. Gently pull the drive out about an inch to disengage the power connection.
3. Wait about 30 seconds for the drive to stop spinning and for the drive heads to park.
4. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out.

   Do not allow the drive to fall and strike anything while removing it.
5. Place the drive in an electrostatic protected container.

   Do not stack drives while outside of the Netserver chassis.



Removing a Hot Swap Drive

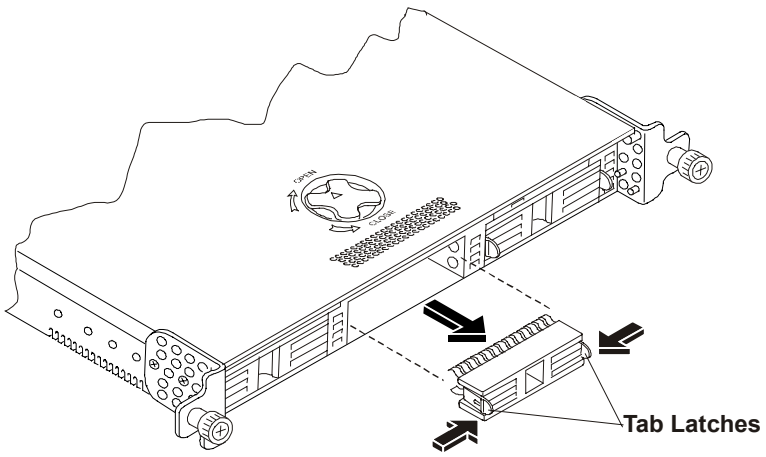
CAUTION	To prevent overheating or excessive electromagnetic radiation, use the filler panels to fill the unused drive bays. If the filler panels are left out of empty drive bays while the Netserver is operating, thermal damage and/or excessive EMI could occur.

Installing Hot Swap Hard Drives

Use this section to install the SCSI hard drives in the Hot Swap drive bays.

CAUTION	Protect the drive from static electricity by leaving it in its anti-static bag until you are ready to install it. Before handling the drive, touch any unpainted metal surface to discharge static electricity. When you remove the drive from the anti-static bag, handle it only by the frame. *Do not touch* the electrical components. Place the drive on the anti-static bag whenever you set it down.

1. Remove the filler panel from the desired drive bay location:
   a. Place a thumb and index finger on the tab latches on the sides of the filler panel.
   b. Press in on both tab latches to release the filler panel.
   c. While keeping both tab latches depressed, pull the filler panel out of the drive bay.



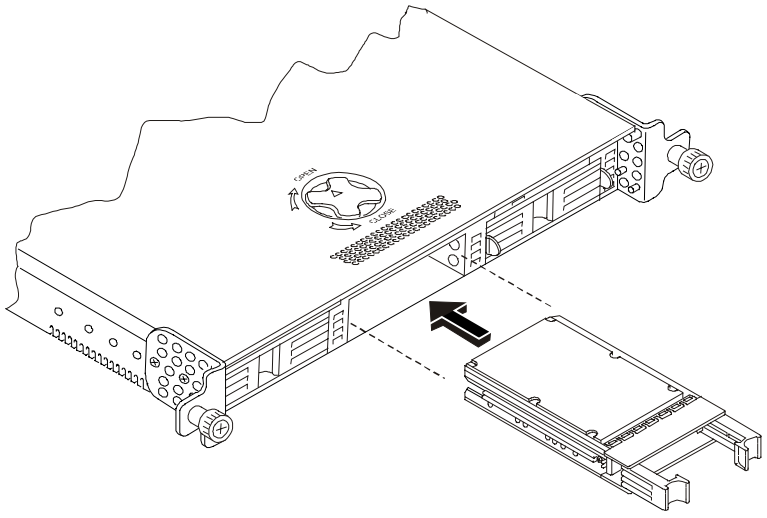
Releasing the Filler Panel's Tab Latches

CAUTION	Save the filler panel for future use. If the filler panels are left out of empty drive bays while the Netserver is operating, thermal damage and/or excessive EMI could occur.

2. Remove the SCSI drive from its protective packaging and open the ejector arms.
3. The SCSI drive should already be mounted in the Hot Swap mounting tray adapter.
   a. Place both thumbs in the center opening at the front of the SCSI drive.
   b. Pull outward on both ejector arms, which moves the locking tabs inward.

   You should hear the each ejector arm click as you pull it outward.
4. Gently slide the SCSI drive into the chassis, until you feel resistance.

   The drive will meet resistance about a quarter of an inch before completely seating in the drive bay.
5. Push the drive in firmly (all the way) to seat the drive in the connector on SCSI back plane.

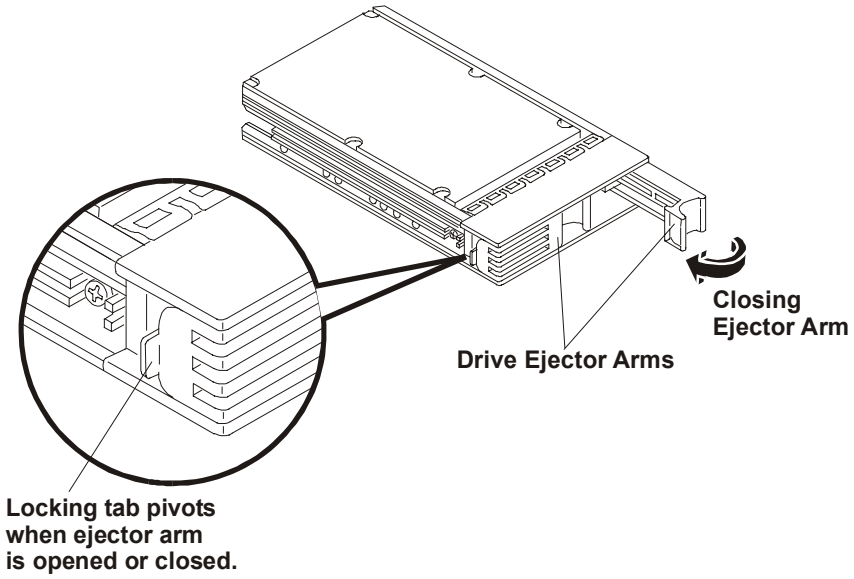


Inserting the Drive

CAUTION	To prevent snapping off the ejector arms do not apply excessive pressure.

6. Close the ejector arms by rotating each one back into place.
7. Verify the tab on each ejector arm engages the edge of the drive bay as you close it.

   You should feel each ejector arm click into place when it closes completely. Closing both ejector arms engages the drive with the electrical connector at the rear of the Hot Swap drive bay and seats the drive.



Closing Drive Ejector Arms

8. If the drive is unseated in the drive bay after closing both ejector arms, repeat this procedure from Step 2 to 5.

   The ejector arms may not have opened enough to engage the tab, or the SCSI connector failed to engage the SCSI connector at the rear of the Hot Swap drive bay.

NOTE	Closing both ejector arms will ensure the drive connector engages the electrical connector in the Hot Swap drive bay and seats the drive.

Removing DIMMs

You may need to remove a DIMM module to downsize your memory configuration or to replace a defective DIMM.

1. If the HP Netserver is already installed and working, power down the Netserver.
2. Disconnect the power cables and all external cables.

   If necessary, label each one to support re-assembly.

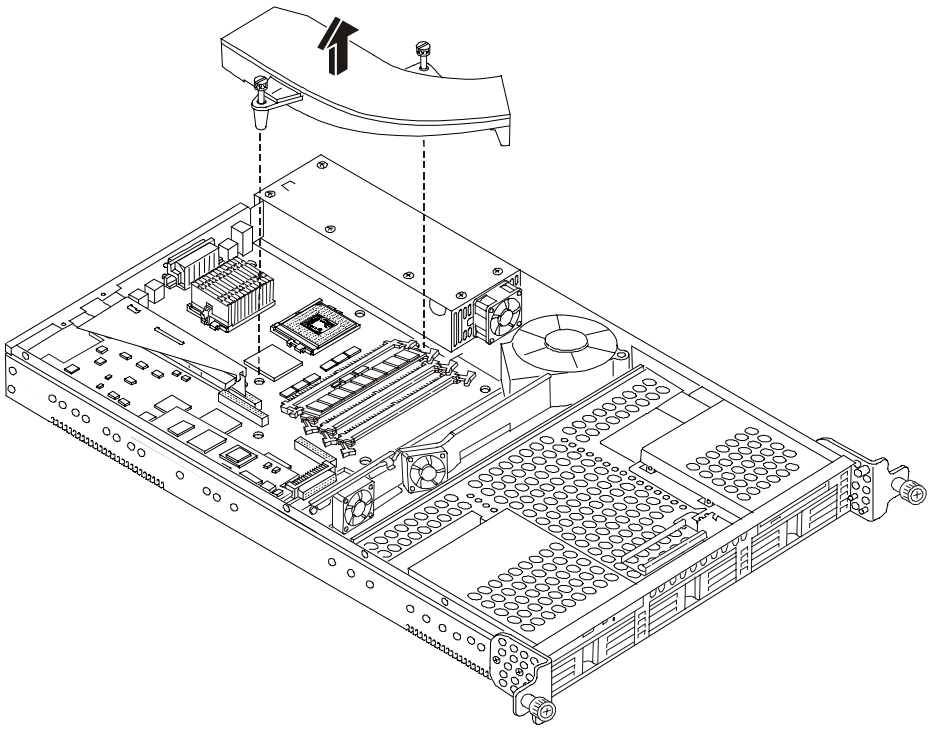
WARNING	The power supply will continue to provide standby current to the Netserver until the power cable is disconnected.

3. Remove the Netserver chassis from the rack and lay it on a flat surface.

4. Remove the top cover.

NOTE	You do not need to remove the system board from the Netserver chassis to install or replace DIMMs.

5. Locate the DIMM slots on the system board.
6. Loosen the two captive screws holding the air duct, which covers the DIMM slots, and remove the air duct.



Removing the Air Duct

7. Open the retaining latches.
8. Lift the DIMM completely away from the slot.
9. Place the DIMM in its anti-static container.
10. Repeat Steps 6-9 for as many DIMMs as you need to remove.

NOTE	If there are no DIMMs installed when you power up the Netserver, you will not get a display on the monitor, but you will hear beep codes.

Installing Additional DIMMs

1. If the system is already installed and working, power down the system.
2. Disconnect the power cables and any external cables connected to the system.

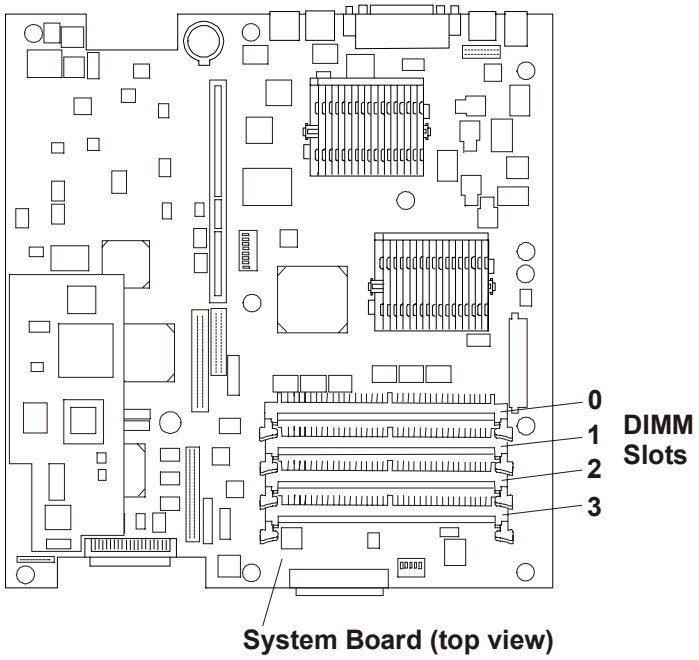
   If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the Netserver LP 1000r until the power cable is disconnected.

3. Remove the Netserver chassis from the rack and lay it on a flat surface.
4. Remove the top cover.

NOTE	You do not need to remove the system board from the Netserver chassis to install or replace DIMMs.

5. Locate the DIMM slots on the system board.
6. Loosen the two captive screws holding the air duct over the DIMM slots, and remove the air duct.



DIMM Locations on System Board

7. Choose an empty slot on the system board to install a DIMM.

   DIMMs may be installed in any combination, in any slot, but HP recommends starting at slot 0 and filling the slots in order with the largest size first: DIMM slots 0, 1, 2, and 3.
8. Spread the two retaining latches on the slot outward.

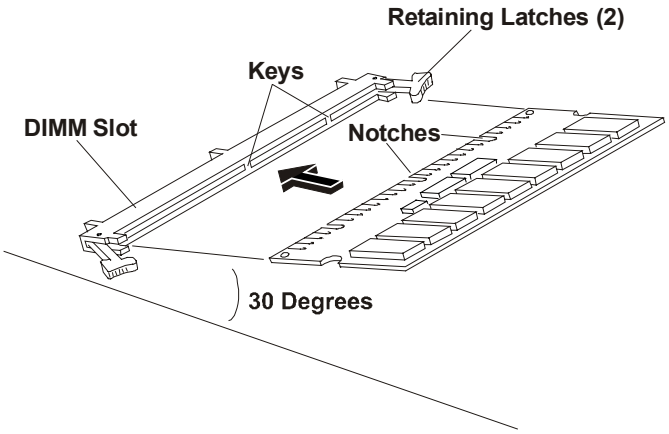
CAUTION	The memory modules are sensitive to static electricity and can be easily damaged by improper handling. Do the following when handling the accessory kit: Leave the memory module in the anti-static container until you are ready to install it. Always use an anti-static wrist strap and a grounding mat. Before you remove a memory module from the anti-static container, touch a grounded, unpainted metal surface on the HP Netserver to discharge static electricity.

9. Remove a DIMM from its container, handling the module by its edges.

   If not ready to install it, lay it on an anti-static surface until you are ready.

CAUTION	Use only HP PC133 (133 MHz) buffered SDRAM DIMMs.

10. Align the notches on the DIMM with the keys on the slot.



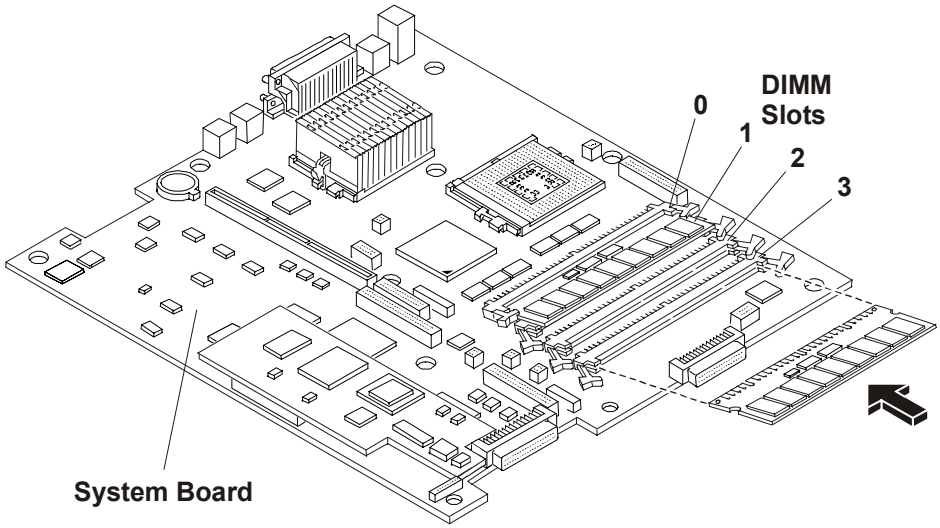
DIMM to Slot Alignment

WARNING	Ensure you hold the DIMM tightly as you push it into the slot. It is possible to turn or bend the DIMM slightly while inserting it, which would damage or break the DIMM socket. If a DIMM socket is damaged, you must use another DIMM slot or replace the entire HP Netserver, since this Netserver is not repairable in the field.

11. Holding the DIMM at approximately 30° to the system board, press the DIMM fully into the slot until the retaining latches close.

    If the latches do not close, the DIMM is not inserted correctly.

NOTE	The system board is shown removed from the Netserver for clarity.



DIMM Insertion

12. Repeat Steps 7-11 to install all of the DIMMs for your memory configuration.
13. If you have completed the DIMM installation, close the Netserver and return it to the rack where power can be applied.

Processor Configuration Guidelines

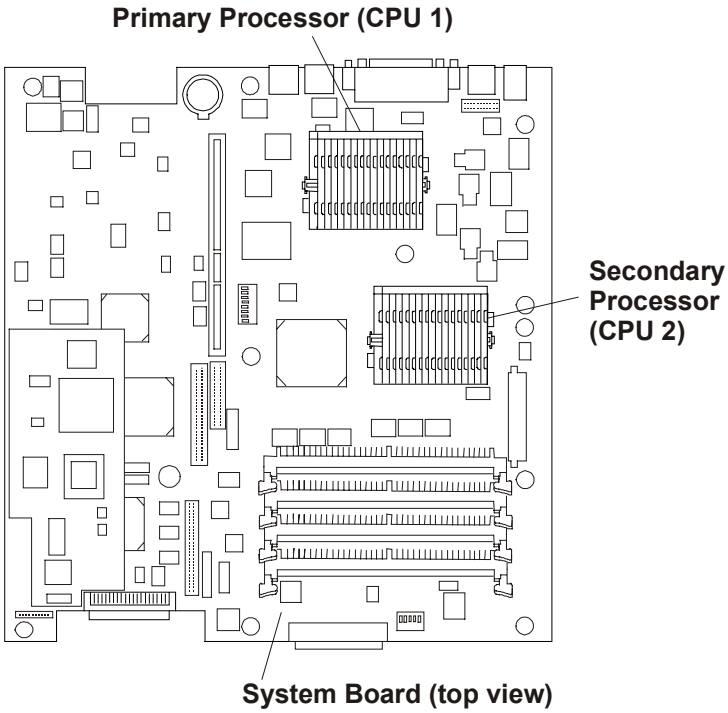
The HP Netserver LP 1000r supports a variety of processor speeds with an FSB (front side bus) speed of 133 MHz. The Netserver supports processor speeds at 867 MHz, 933 MHz and 1 GHz.

NOTE	Some processor speeds listed for this HP Netserver may not be supported. For the latest support information, visit the HP web site: http:/www.hp.com/netserver.

CAUTION	Do not open the new processor's protective bag or remove the processor from the bag until you are ready to install it. Before you remove a processor from the anti-static bag, touch a grounded, unpainted metal surface on the HP Netserver to discharge static electricity.

- Both processors must be the same processor type and have the same product number, which insures the same clock speed, cache size, and FSB speed.
- The processors must operate at the designated speed stated by the product type on the processor.
- Use only processor upgrade kits with the same HP product number.

  This ensures the processor type, clock speed, and cache size are the same.
- Ensure a processor is installed in the primary processor (CPU 1) socket before installing a processor in the secondary socket (CPU 2).



System Board

Installing a Second Processor

This section provides the instructions for installing a second processor and its accompanying heatsink on the system board.

CAUTION	The processor is sensitive to static electricity and can be easily damaged by improper handling. Do the following when handling the accessory kit: Leave the processor in the anti-static bag until you are ready to install it. Wear an anti-static wrist strap and use a static-dissipating work surface or grounding mat connected to the chassis when handling components. Before you remove a processor from the anti-static bag, touch a grounded, unpainted metal surface on the HP Netserver LP 1000r to discharge static electricity.

1. Unpack the processor shipping box and check the contents against its packing list.
2. If the Netserver is already installed and operating, shut down the NOS according to directions in your NOS documentation.
3. Press the power switch on the HP Netserver's control panel when prompted by the operating system.

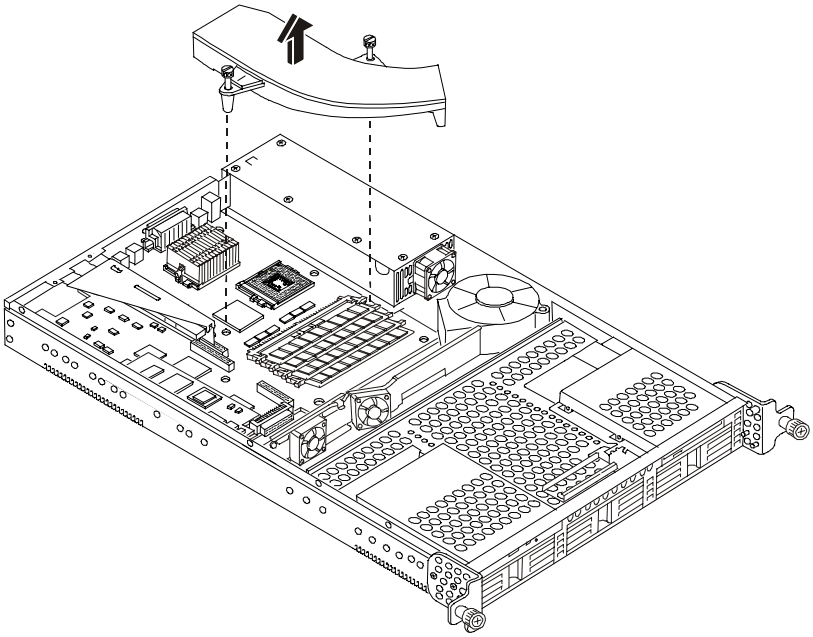
   Normally, this completes the shutdown procedure.

WARNING	Power supplies will continue to provide standby current to the Netserver until the power cables are disconnected.

4. Disconnect the AC power cord.
5. Gain access to the system board by following the appropriate instructions for removing the chassis from the rack and removing the cover.

NOTE	It is not necessary to remove the system board from the Netserver to install the second processor (CPU 2).

6. Loosen the two captive screws holding the air duct over the DIMM slots, and remove the air duct.



Removing the Air duct

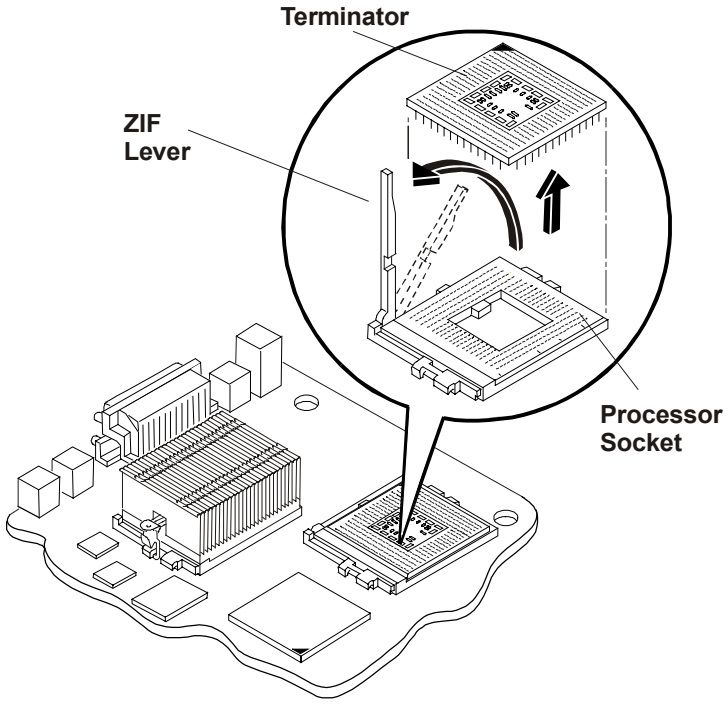
7. Ensure the processor speed of the second processor (CPU 2) is the same as the existing processor before installing the second processor.

NOTE	If you are upgrading the second processor to a faster processor speed than the primary processor, the primary processor must also be changed. Both processors must have the same product number, which includes the same clock speed, cache size, and FSB speed. The supported processors only perform at the rated speed indicated on the processor in the HP Netserver.

CAUTION	Always wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

8. Open the ZIF (Zero Insertion Force) lever to allow removal of the terminator installed in the processor socket.

   You need to pull the lever out away from the ZIF socket and then raise it to a full 90° to the system board.



Removing the Terminator

NOTE	Retain the terminator for future use. The Netserver will not operate properly if using only one processor with no terminator installed in the second processor socket.

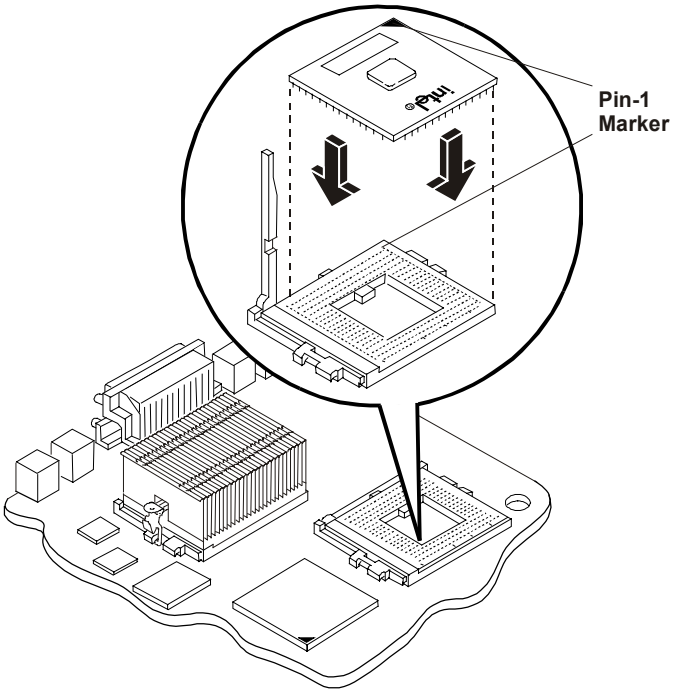
9. Lift the terminator out of the socket and place it on anti-static surface or bag.
10. Align the second processor over the empty processor socket.

    The socket has a triangle marking for pin-1 that should match the triangle for pin-1 on the processor near the end of the ZIF lever.

CAUTION	Ensure you the align pin-1 of the processor with pin-1 of the processor socket or pin damage will occur.

11. Insert the second processor into the socket and close the ZIF lever to fully seat the processor.

    You should hear the ZIF lever click when it closes properly.



Installing the Processor on the System Board

NOTE	No speed switch settings are required for the supported processors (867 MHz, 933 MHz, or 1 GHz) in the HP Netserver. These processors rely on the internal settings within the processors and do not rely on external switch settings on the system board.

Installing the Heatsink

Once the processor is installed, the heatsink must be installed on top of the processor. A thermal patch on the bottom of the heatsink provides thermal bonding between the heatsink and the processor. The thermal patch must be replaced if the heatsink is removed (even temporarily) from the processor. You will find extra thermal patches taped to the PCI card cage inside the server.

1. Remove the heatsink from the shipping container. Do not touch the thermal patch on the bottom of the heatsink.
2. Inspect the thermal patch. Replace the patch if it is damaged:
   a. Make sure you are grounded with a static-dissipating wrist strap.
   b. Remove the damaged patch. If you are reinstalling a heatsink on a processor, also scrape off any thermal material remaining on top of the processor chip. You may use your fingernail to scrape the material off.
   c. To install a new thermal patch, peel off the backing, and place the patch in the area marked at the center of the heatsink.

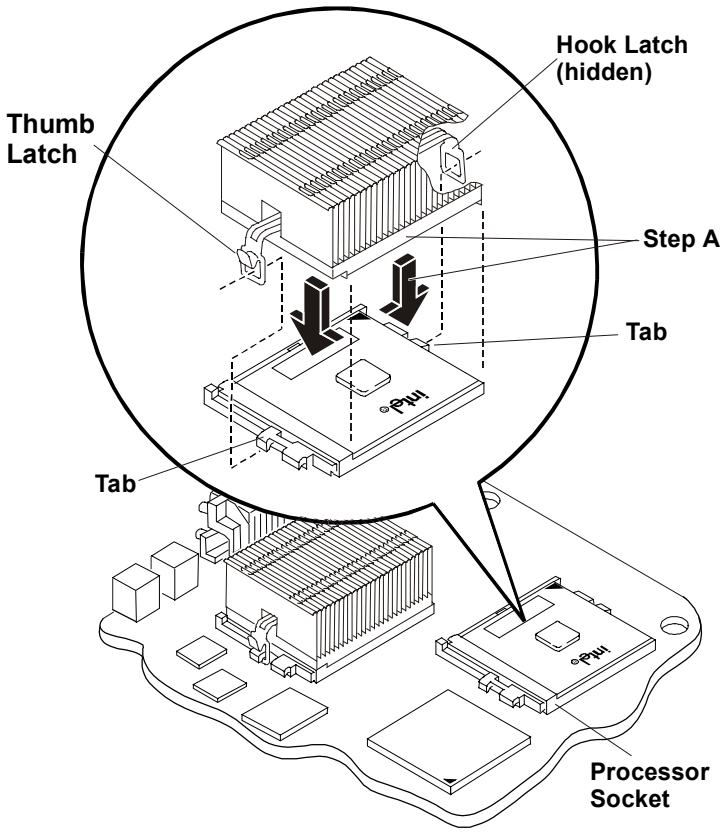
CAUTION	Heatsinks are not reusable unless the thermal patch is replaced *each time* the heat sink is removed, even if it is temporarily removed and reinstalled on the same processor.

3. Install the heatsink:
   a. Orient the heatsink with the tool latch facing left. Lower the heatsink squarely onto the processor.

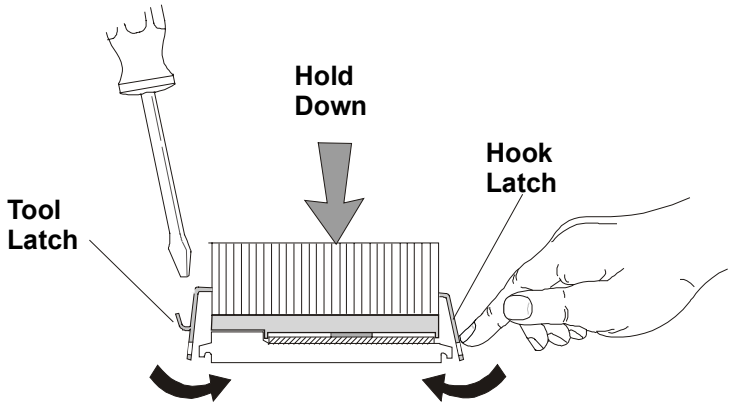
CAUTION	Ensure the heatsink is seated properly on the processor. If the heatsink is offset even slightly, there will be insufficient thermal contact with the processor, which may result in overheating, data corruption, and permanent damage to the processor.

   b. Hold the heatsink steady with one hand and press the hook latch down to connect it to the tab. Then insert a flat-head screwdriver into the tool latch and press down to connect the latch to the tab.
4. Replace the air duct.

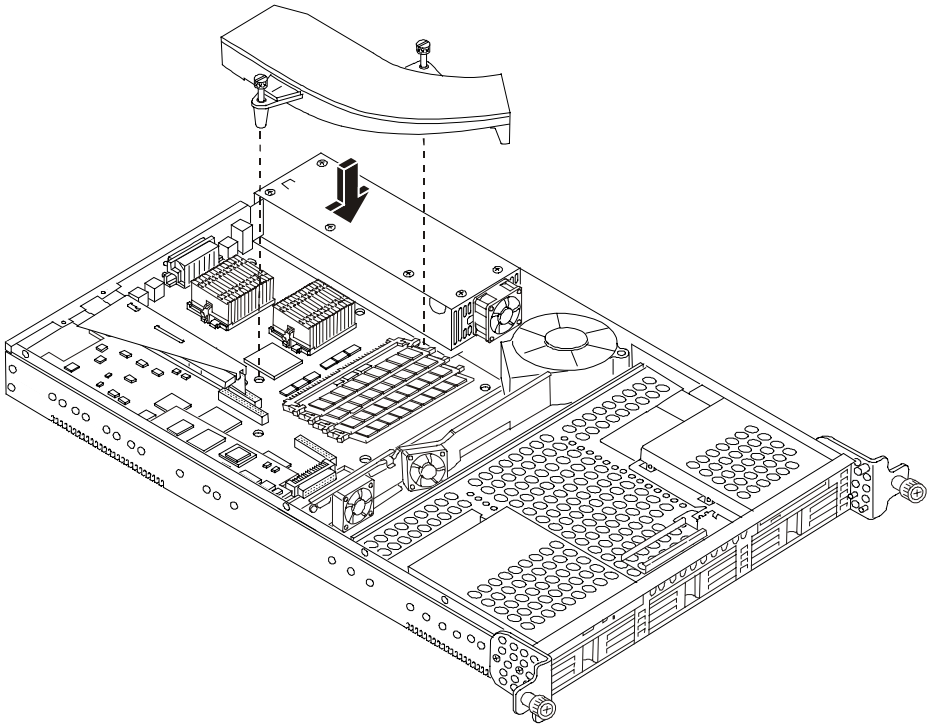
CAUTION	To prevent scratching off some of the thermal material, don't slide the heatsink around once it is on the processor. Rocking it slightly to install both sides of the latch is acceptable.



Placing the Heatsink on the Processor



Setting the Latches



Replacing the Air Duct

Removing a Processor and Heatsink

Use this procedure to remove a processor and its heatsink. The heatsink must be removed, before removing the processor.

CAUTION	Always wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin. Before you touch the processor to remove it, touch a grounded unpainted metal surface on the HP Netserver to discharge static electricity.

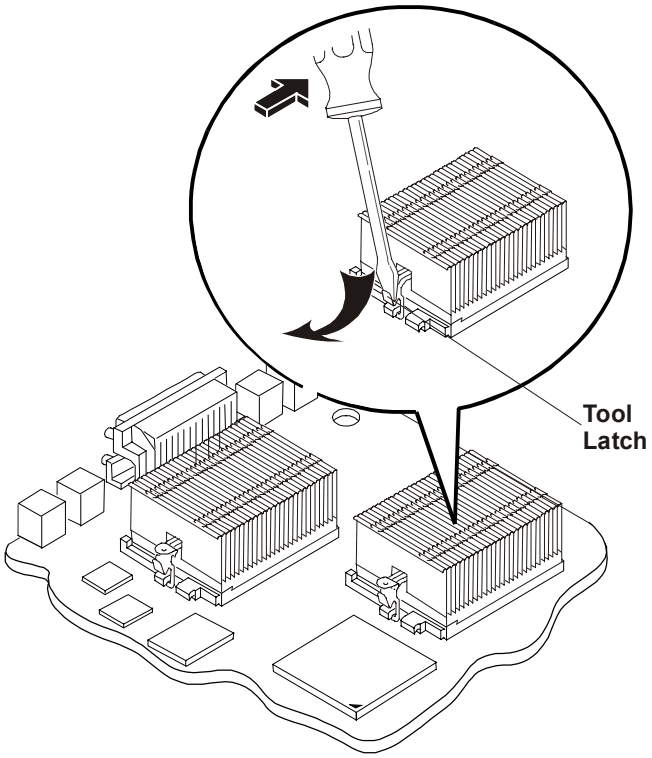
1. Loosen the two captive screws holding the air duct over the DIMM slots, and remove the air duct.
2. Use a screwdriver or similar tool to unhook the tool latch on the heatsink.
3. Tilt the heatsink back towards the hook latch and release the hook latch.
4. Lift the heatsink away from the processor and out of the Netserver.
5. Open the ZIF lever to allow removal of the processor.
6. Grasp the processor by its edges and lift it out of the socket and place it on a static-dissipating work surface or into an anti-static bag.
7. If you are not replacing the processor with a new or replacement processor, you must install the terminator into the empty processor socket.

CAUTION	The empty processor socket must have a terminator installed if you are not installing a processor into the empty socket.

8. If you intend to use the heatsink again for a new or replacement processor you must insert a new thermal patch on the bottom of the heatsink.

   Refer to the heatsink installation procedure earlier in this chapter.

CAUTION	To prevent damage to the replacement processor, remove the old patch and install a new thermal patch to the bottom of the heatsink before installing it on the new processor. The heatsinks are not reusable, unless the thermal patch has been replaced each time the heatsink is removed. Each time the heatsink is used on the processor, some of the thermal material is removed from the thermal patch, which could cause poor heat transfer and overheating.



Removing the Heatsink

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